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UP or down?

CAUGHT between the vicious upward surge of costs and the downward surge of business, industry volume did a tailspin in October and at present faces a moratorium or stalemate which will continue until such time as it becomes evident that either the upward swing of costs on business operations shall be controlled and lessened or that the volume of business upswing sufficiently to justify the absorption of the present high cost factors.

Foremost in the upward costs are all those punitive, unscientific taxes, such as capital taxes, profit taxes and all that horde of special taxes, which have hobbled and hindered business development and have effectively prevented any investment expansion in productive industries.

And not the least contributing factor to the enormous bill, which industry has to assume and the consumer has to pay, is the lost time and wages, which labor squandered in unwarranted, uncontrolled strikes during the past year. Added to these staggering costs is the continued, unprecedented spending of money for the upkeep of a political dynasty and bureaucracy, unparalleled in the history of this country.

All of these costs must be paid.

The only way they can be paid is by adding them into the costs of commodities and collecting them from the consumers.

The consumers are now on a buying strike. Hand-to-mouth buying is the order of the day and Mr. Johnny Q. Public has snapped his pocketbook shut with a decided click and he won't open it again until he sees some unmistakable signs that the powers that be have returned to a state of sanity. Hence the stalemate.

The stalemate can't last. Business volume will move shortly. Will it be up or down?

The question uppermost in the minds of the people is—will there be any relief from these excessive costs? These are the factors they are keeping their eyes upon. They believe that the upward swing of business volume is dependent upon the control of costs and the abolition of all unnecessary tax hobbles upon business expansion. They know that business volume on November first was 68 per cent of normal, a decline in two months from a high of 80 per cent of normal. In this short time, business volume lost all its hard-earned gains for the past twenty-one months. It is a crucial and crippling loss, which cannot be made up speedily unless there be some speedy remedial action taken to reduce unnecessary costs.

Fortunately, there is a session of the Congress called for November fifteenth. To this Congress, the eyes of the people are turned hopefully and expectantly. What will this Congress do?

Congress can break the stalemate. For just as soon as there appears an independent initiate for remedial legislation and a sympathetic recognition by Congress of the ills and injustices that afflict the tax producers and payers, there will be an immediate rebound of confidence and an upward surge of business.

This coming session of Congress is an epochal session. Probably, never before in the past fifty years has the confidence of the people been so patently pinned upon the belief that "this Congress will start the real recovery."

What Congress does in this coming session will determine the trend of the next business phase—up or down?

+ EDITORIAL +

A Panorama of Progress

CHEMISTRY and chemical engineering during recent years have made indelible impressions upon the advancement of the pulp and paper industry.

No longer is the chemist looked upon within the industry as a trouble maker or a nuisance, but rather as a necessity to good mill operation. He came into the industry unwanted by most production executives, but, in spite of this obstacle, he has been able to make a definite and permanent place for himself. He took an industry which for centuries had functioned by rule of thumb methods and standardized it. He improved processes and developed methods which permitted the production of more uniform products. He caused new and better products to be produced. He removed the cloak of secrecy from common mill operations and in so doing advanced the status of the entire industry.

The chemical engineer likewise found a niche in the industry to be filled. Not only was he interested in improving existing methods and in developing new ones, but also in process equipment design improvement and in applying equipment which had proven itself in some other industry or industries to the making of pulp and paper because of certain design advantages common to it.

Numerous also have been the contributions of other technical men, who together with the chemist and chemical engineer have brought to the pulp and paper industry an attitude of mind that might be likened to that of a student eagerly engaged in the acquisition of knowledge. One stimulating influence to this attitude of mind, an influence which has borne fruit for nearly twenty-two years through visual presentations and personal contacts, has been the Exposition of Chemical Industries.

This Exposition was originated during the early days of the World War by Charles F. Roth, with a notable committee of chemists and chemical engineers. Dr. M. C. Whitaker, vice president of the American Cyanamid Company, now Chairman of the Committee, was one of the original committee. The first Exposition was held during September, 1915, and now the Sixteenth Exposition is scheduled to be held during the week of December 6 to 11, 1937, at the Grand Central Palace in New York City. Charles F. Roth is manager.

To describe all of the products to be displayed at this Sixteenth Exposition would require the space of many books. There will be exhibits of many chemical products and raw materials; of general plant equipment; of processing machinery; of pumps, piping and hydraulic accessories; of materials handling equipment; of containers and packaging; of laboratory equipment and supplies; of precision instruments; and of metals and alloys as well as of other products. In brief, it brings together in one place many developments in both materials and machines as an aid to the chemist, engineer and production executive of any industrial plant in visualizing products in relation to their application as a means of increasing efficiency and decreasing production costs.

Most certainly, it would be of advantage to every chemist, engineer or production executive associated with the pulp and paper industry, wherever possible, to arrange to attend this Exposition. The opportunity to learn will be there. It simply will take the desire to profit from it.

A Grateful Thought for Knowledge

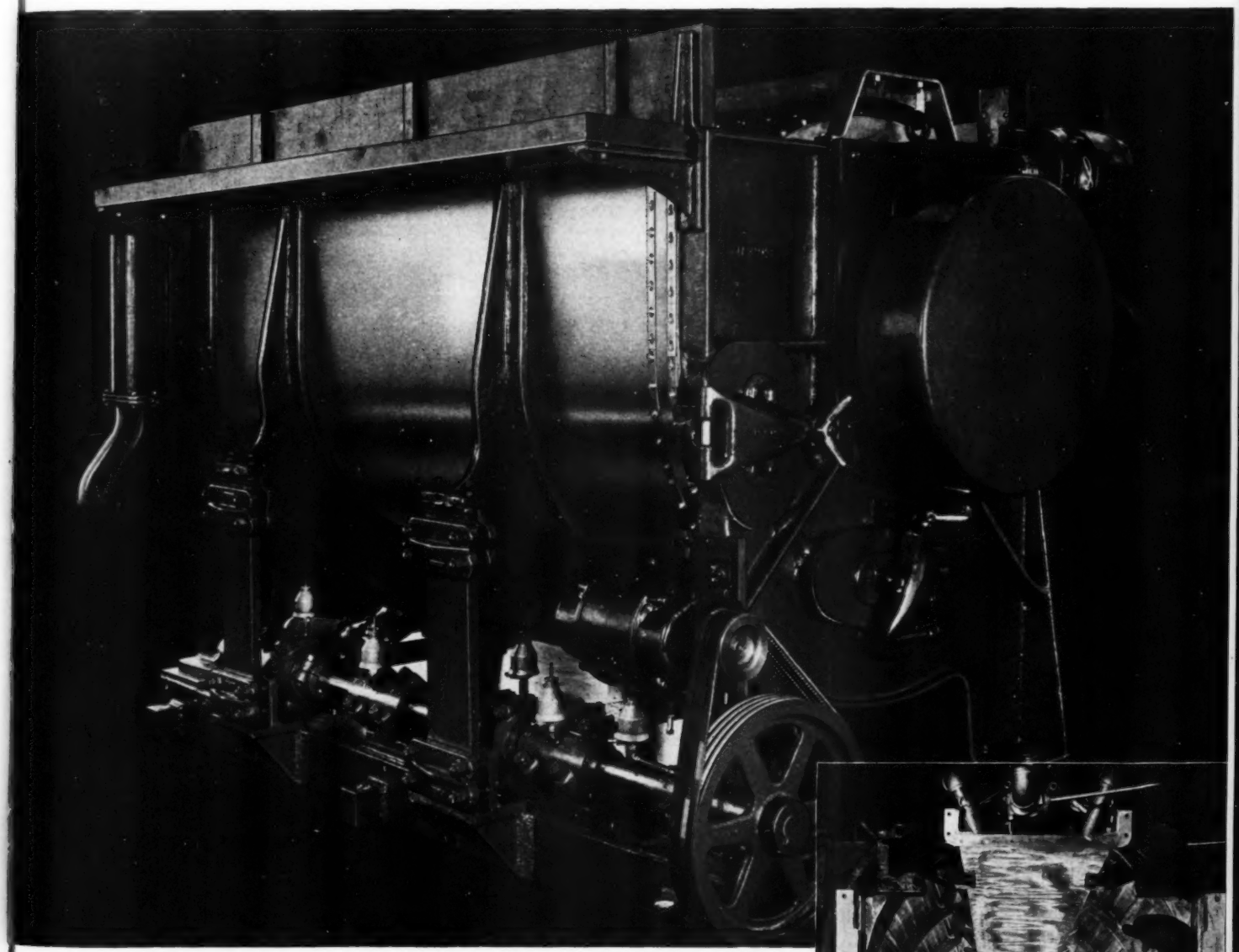
CRISP autumn days with lingering memories of a delightful summer give one a sense of well being. We grow thoughtful and reminiscent as the year begins to wane and in keeping with the greatest of American traditions, we enter into the national spirit of thanksgiving.

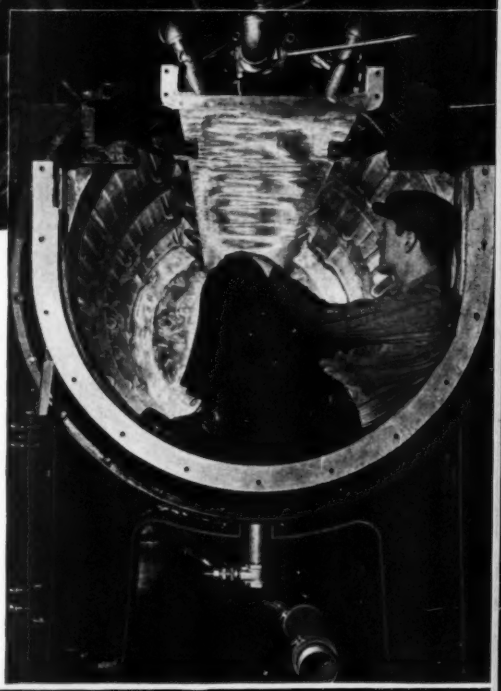
It is only natural, of course, that humanity feels a deep gratitude for material blessings since these necessities enrich our existence and contribute to our general happiness. But we take so much for granted. We accept so many things made possible by the progress of man and his inventions without realizing that the pioneer in industry and in science gave of himself that we, his posterity, might live in ease and comfort, and in the light of greater knowledge, might pass on even greater things to future generations.

For one thing, we accept as a part of our existence the fine libraries which are available in almost every town of any size. In addition to books on almost every subject, periodicals of every description contribute to the advancement of knowledge and thousands of newspapers keep the people of the country informed on what is happening in every part of the world. Contrast all this with the struggles of our pioneers who lacked books and educational advantages, and it leaves us wondering what would have been the progress of the country's educational system without books—and thus without paper. Have not the scientists in our great industry contributed one of the most vital elements to the progress and contentment of the human race and its education? Yes, the papermaking industry has done its share and humanity is grateful.

YOU CAN MAKE MORE MONEY WITH THIS NEWEST

BIRD SCREEN





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THE BULK OF NORTH AMERICA'S PAPER PASSES THROUGH BIRD SCREENS

CURRENT THOUGHT

Antidote for Ditheritis

WILLIAM SIBLEY

ONE of the most amazing things about American business men is the characteristic of inconsistency. Our ability to be blind at a time when we need vision, and our affinity for silly and needless dithers is both astounding and confounding. Just now it seems to be the fashion to talk business down. With the stock market going haywire we find a sort of salty satisfaction in talking, thinking and being lugubrious. On every side and on every occasion we evidence love for the dithers. And it is all so silly, so needless, and withal so costly—it becomes tragic.

The hue and cry at the moment is over the drop in steel output. With potential plant capacity dropping from somewhere in the nineties to the upper fifties we insist that the world is going to rack and ruin. Now if we were doing business in a fortnightly basis, such a drop might well be a matter of grave concern. But we don't do business on two-week schedules. We go along month aftr month and year after year. And since it is our intention to go on doing business for some time to come, it might be well to realize that during the first nine months of this year steel ingot production exceeded last year's production by 27 per cent—and fell short of reaching the 1929 all-time high by only two per cent. But still we insist upon taking down our hair and weeping because, this year, we failed to reach the mark set by the world's most prosperous year by the stupendous percentage of two. And we continue to weep, knowing all of the time that just as soon as the automobile manufacturers get into production of their new models, and the railroads get a decision on freight rate increases that both the automotive industry and the railroads will place upwards of three billions in steel orders.

Being in the dithers we love to talk and think and dream about our unemployed. . . . almost refusing to read the findings of the National Industrial Conference Board which tell us that out of 53 million workers in this nation only about ten per cent are unemployed. And those figures even include the men on WPA and other federal projects originated in the name of "emergency."

Gentlemen, business in almost every fundamental line is good. Unemployment is no greater than it has been several times in the past when we did not consider ourselves in a depression. During the past five years, the incomes of the American people, including farmers, have constantly increased and are still increasing. Payrolls are even yet being stepped up, although many of us insist that business is on the down-grade. Indeed, the business totals today (and I mean per capita) would have strained our credulity fifteen years ago. The pains we complain of today are growing pains, *not* organic difficulties or dangerous infections.

Something of an antidote for this case of ditheritis in which we find ourselves is the commercial history for the past one hundred years. If we do not attain an all-time business high—an unprecedented business peak in 1939—we will be breaking a known record of 100 years. And when I say that I am not talking about next year, or 1940—but 1939. And I particularly specify 1939 because for one hundred years this nation has consistently and continually set all-time high records every decade and in the final year of each decade.

It is a known fact that following the depression of 1837-1838 business volume in this country attained a new all-time high in 1839. Real estate sales, commodity prices, wages, earnings and dividends were, in that year, higher than they had ever been before. And although business records are not as complete as we should like to have them, it is a known fact that in every succeeding ten-year cycle, subsequent highs were made. In 1849-1859 and following the Civil War in 1869, each and every "nine" brought business to new record breaking peaks. The same follows through with 1879-1889, 1899-1909. Each final year in each decade saw commercial pursuits enjoying unprecedented prosperity. In 1919, American business was again in a dither. What should we do with our excessive plant production, born of war demands? What should we do with the five million soldiers, all out of jobs? Yet in 1919 we broke all records for business activity, real estate prices, wages, dividends, corporation earnings. Then again in 1929 we similarly broke all previous records.

There is a business cycle. It has nothing to do with sun spots, astrology, or superstition. We know little about it and we do not understand it, but certainly it is more than passing strange that for 100 years a new high mark has been set up in this country every decade, and in the final year of each decade. One year from now we will be entering the last year of the present decade. In case business activity does not record a new all-time business high in 1939 it will break a known record of a century. And frankly (leaving aside such emergencies as a war), I believe the business cycle will continue regardless of the party in control of Washington politics or the propensities of American business men for dithers. Being an American first and a republican afterwards, I am still of the firm conviction that this nation has far to go to attain its peak of commercial destiny.

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THE PAPER INDUSTRY
A MONTHLY EDUCATIONAL JOURNAL

Italian Contributions to the Making of Paper

RAFFAELE SANSONE

THE Italian paper industry, now more than seven centuries old, had its beginning with the establishment of a small hand paper mill at Fabriano, from which point the industry extended itself throughout the peninsula. By the fifteenth century, there were numerous paper producing firms in Piedmont, Liguria, Lombardy, Tuscany, Emilia and Veneto, but during the second half of the last century there was a tendency toward concentration; a tendency that has since continued to develop and which has brought the industry more and more into the hands of large financial groups. Due to this concentration, the number of mills has been reduced and the use of machinery has increased.

Around 1876, there were 813 vats for producing handmade paper, 73 cylinder machines and 95 fourdrinier machines in use in Italy, with a combined production of about 60,000 tons of paper and paperboard. In 1913, there were approximately 400 paper mills with 268 fourdrinier machines, 338 cylinder machines and 108 vats. The World War and the post-war period, however, resulted in a reduction of activity and personnel in the mills. By 1925 very few vats were in existence and these were used exclusively for special papers. During 1925 there were 346 cylinder machines and 276 fourdrinier machines in use.

It was not until 1932 that Italy regained a normal production schedule. In that year there were 389 paper mills which employed about 26,000 people. It was

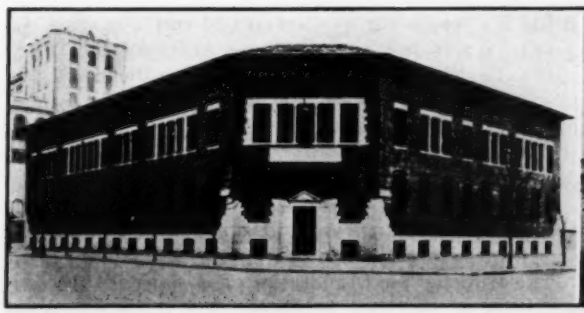


Figure 1

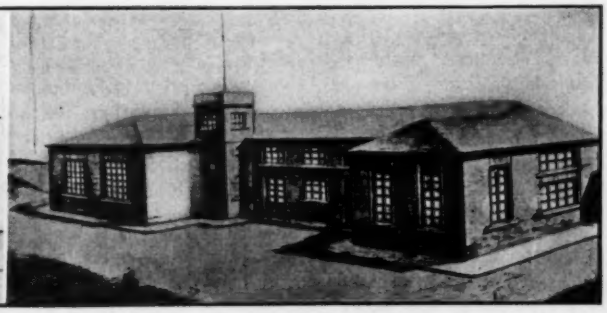


Figure 2

during this year that a dozen of the most important mills consolidated into a unique group, contributing by this action towards the ever present tendency to greater amalgamation of the Italian paper and paperboard industries.

In September, 1934, the Italian paper and paperboard mills had a production of 35,848 tons against 30,352 tons during the same period in 1933. In the last half of August, 1934, there were 21,088 operatives employed. In March, 1937, the Italian production of paper and paperboard reached 42,031 tons against 40,049 in the same month of 1936. The production of woodpulp during March, 1937, was 10,868 tons and the production of cellulose was 2,836 tons against 9,861 tons of woodpulp and 1,727 tons of cellulose, respectively, produced during March of 1936. These production figures refer to 214 paper and paperboard mills and to 33 pulp mills. Excluded from these figures are mills which employ less than 15 operatives.

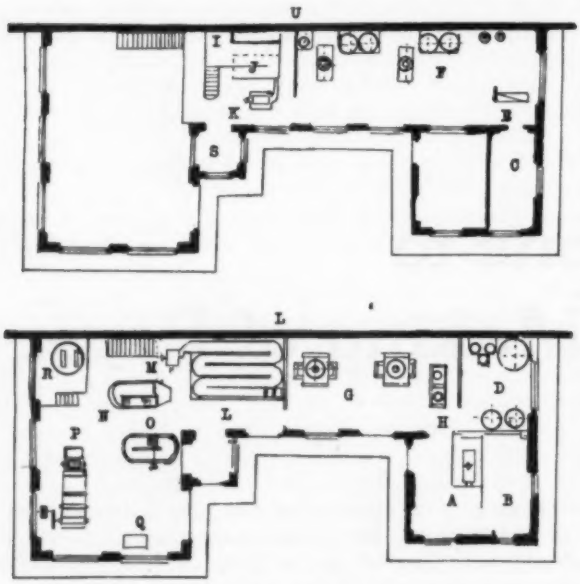


Figure 3

In 1876, the annual production per workman was about 3½ tons. At present, the production per operative is about 18 tons. There were 28,023 people employed in the mills during March, 1937, as contrasted with 27,555 operatives employed during the same month of 1936.

The constant rise in production which slackened somewhat during unfavorable years, greatly influenced the conditions surrounding importations and exportations of paper products. In 1934, Italy imported some 24,591 tons against 9,118 tons of exportations; a commercial deficit for Italy of 15,472 tons with an estimated value of $736,842.

Due to the fact that the Italian paper industry has developed and modernized its plants whenever possible, and because of the many technical advances, it is, at present, in a position to not only satisfy the demands of the domestic market but also to develop an export business, especially with the Orient and South America.

The Italian paper industry is certainly on its way toward further development; a development that is being hastened by the Fascist Party and one that will undoubtedly result in a much heavier domestic consumption of paper and paperboard. At present the annual consumption of paper and paperboard in Italy, per inhabitant, is only about 9 kilos (19.8 lbs.).

The sanctions period and the months following it, resulted in new difficulties, among which was the raising of social capitals to face the lower value of the lira and the arrangement of an increase of from eight to ten per cent in salaries. Despite these conditions, however, the most important firms did not fail to pay dividends.

Until June, 1937, facilities were arranged to consolidate regularly constituted commercial and industrial firms. During this period the consolidation of the following paper mills was effected: Societa Anonima Andre Maffizzoli and Toscolano Garda; Cartiere di Besozzo, Milan and Cartiera Friulana, Milan and Cartiera di Vignola, Milan.

A law passed on January 12, 1933 subjected all paper, paperboard and allied products plants and all industrial expansion of already existing establishments, to government authorization. By a decree dated June 20, 1934, the Societa Anonima Cellulosa-Soda Cloro, of Rome, was authorized to install in the territory of Foggia, a new plant for the production of cellulose from corn and straw through the use of electrolytically produced caustic soda and chlorine gas. Paper and paperboard also were authorized to be made from cellulose.

Experimental Station for Paper and Fibers

One of the agencies which has aided most in the development of the Italian paper industry is the Experimental Station for Paper and Fibers. This station, located in Milan, was established for the following purposes:

(1) To contribute, through experimental research, towards the solution of different papermaking problems and of problems relating to artificial fibers; and to work toward the technical and economical improvement of the industry as a whole.

(2) To experiment with and to divulge new methods for using raw materials and to study means of improving those already in use.

(3) To search for new sources of raw materials.

(4) To give opinions and to act as consultants.

(5) To make analyses, trials and experiments on products and raw materials at the request of the public, industry or public officials.

(6) To place the laboratories at the disposal of students for research, experiments, etc.

The Experimental Station for Paper and Fibers occupies a site of its own. Its principal building is shown in Figure 1.

The Ministry for Corporations has approved the construction of two new buildings, one to be connected directly with the present structure and the other to be

isolated from it. The first of these two new buildings will be used for the study of textile fibers and the other (Figure 2) for the study and production of cellulose. The latter building will be equipped with apparatus and machinery necessary for manufacturing cellulose

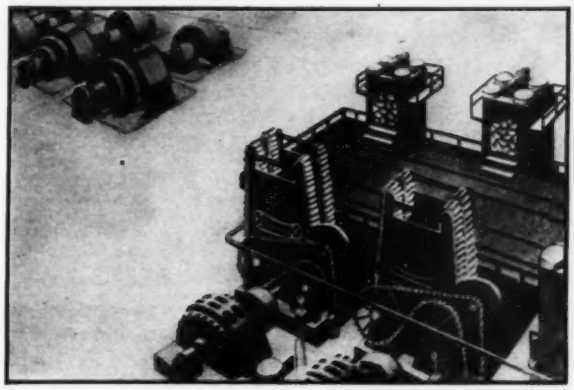


Figure 4

on a semi-industrial scale by the different commercial processes or by new methods.

The upper story of the building will be used for the preparation of fibrous materials previous to the charging of the digesters and to chlorine treatment. Two rotary digesters for acid and alkaline treatments will be located on the ground floor and will be heated with steam at a maximum pressure of 12 atmospheres, supplied direct, indirect or mixed. In addition, equipment will be installed for the preparation of acid and alkaline liquors as well as for the partial recovery of the spent liquors. In brief, the building will house all the equipment necessary to duplicate on a small scale, the working operations of a mill with the necessary adaptations of an experimental plant.

Washing will be performed in the digesters and in vats. The pulp will be passed through a fiber separating machine and thence to a storage vat. The successive operations include knot separation, sand separation and screening. A bleaching engine receives the screened stock. It is also used as storage for the stock used in manufacture of cellulose cardboard. A kollergang and a small refining engine are two other items which may be installed at a later date.

Figure 3 shows how the apparatus and machinery will be distributed on the upper (U) and lower (L) floors of the cellulose building. In this diagram, (A) indicates the boilers, (B) coal storage, (C) raw material storage and (D) liquor preparation room. A straw cutter is indicated by (E) and vats for measuring and recovering the liquors by (F). Two rotaries, each of 220 gallon capacity, are indicated by (G), two each of 11 gallon capacity by (H), an opening machine by (I), a storage vat by (J), a knot separator by (K), a sand separator by (L), a screen by (M), a bleaching engine by (N), a refining engine by (O), a pulp press by (P), an hydraulic press by (Q), a kollergang by (R) and an elevator by (S).

Mechanical Wood Pulp

During the second half of the last century, the Italian paper industry had to struggle to secure the raw material needed for its continually expanding production of paper and paperboard. Rags, which had been the means of Italy's primacy in the field, were no longer available in sufficient quantity. In addition, the supply of wood was scarce and Italy was forced to import more and more material. For quite awhile, however, importations limited themselves to tolerable amounts because of the relatively small productive capacity of the Italian paper industry. At the same time, little attention was given to the production of cellulose, other than by a limited number of industrialists and students.

Despite these conditions, the Italian industry forged ahead and managed to obtain necessary raw materials even in the most difficult of times. The production of mechanical wood pulp increased, in the course of years, to the point of rendering many paper mills independent of foreign countries. This activity was due to the effort placed in extending poplar and pine tree cultivations, to which the Facist Government gave its hearty support.

In 1896 there were only 10,000 tons of mechanical wood pulp produced but in 1934 the figure reached 104,600 tons and imports fell to quite inconsequental figures.

During the World War, the Italian cellulose consuming industries literally accomplished wonders in

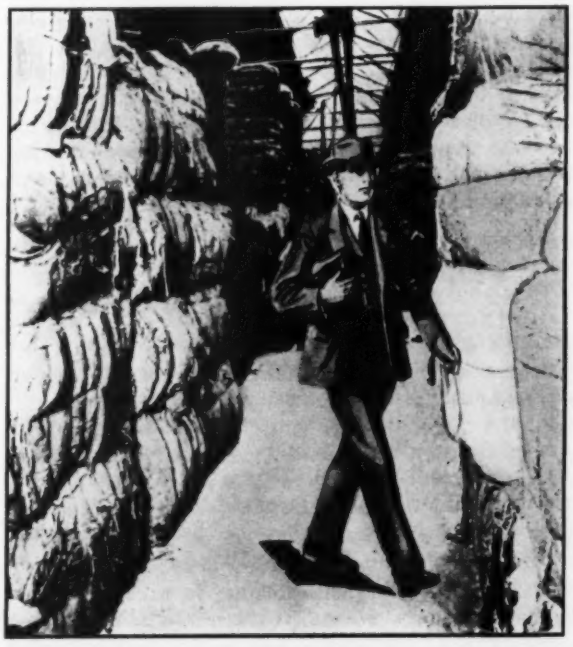


Figure 5

order to overcome the difficulties arising from lack of raw materials. From this date on, the problem of securing a strong national cellulose output was ever foremost. The Milan Experimental Station for Paper and Fibers occupied itself with experimental research, propaganda and consultations with the authorities,

which governed economical and industrial activity in Italy and its colonies. At present, mechanical wood pulp is imported into Italy in comparatively small quantities and nearly all of the imported material is procured from neighboring countries, such as Austria, Czecho-Slovakia, Jugoslavia and Switzerland.

The production of mechanical wood pulp tends to develop continually. From 45,000 tons in 1906, it has

Figure 6

passed to 98,700 tons in 1927, 112,745 tons in 1928, 118,954 tons in 1929, 124,300 tons in 1930 and 130,000 tons in 1935.

The Burgo Paper Group has increased the mechanical wood pulp production by 55 per cent, having in operation at present, at Stabilimento di Verzuolo, the most important wood pulp plant in Italy (Figure 4). The plant, equipped with ten grinders, has a capacity of 150 tons per day. This unit of the Verzuolo mill has the advantage of being able to produce in summer, enough mechanical wood pulp to satisfy winter needs, thus co-ordinating mill operation with the production of electric energy.

Storage of this pulp is accomplished at the Verzuolo paper mill through the use of modern silos, the largest of which holds upward of 2,000 tons of the pulp.

Use of Rags

Although the use of rags has been discontinued by many paper mills, their consumption is still considerable, and quantities of them make their way to certain paper producing centers where warehouses of the type shown in Figure 5 are often required for storage. The principal rag centers in Italy are Milan, Genoa, Turin, Naples, Leghorn, Monza, Prato, Padua, Biella and Bologna.

The plants of the firms dealing in rags have been improved within recent years and their working organizations have been so arranged to supply a good portion of the raw material necessary for certain papers and textiles as well as large quantities for export.

Rags are sorted according to their composition, color fastness, degree of cleanliness, fineness, etc. White hemp and linen rags are used rather widely in the production of handmade paper, drawing paper, register paper, bank-notes, etc. Raw hemp, linen rags, wastes and old ropes, strings, and sacks are used for certain qualities of paper and for paperboard, cigarette paper and strong packing paper.

In Figure 6 is shown a large sorting department in which rags, rag wastes, spinning wastes, weaving wastes and paper mill wastes are selected carefully and the sorted material stored in bins until needed.

Other forms of waste find utilization in Italy, particularly old papers, periodicals, books, waste packing papers and paper cuttings. These are collected by special firms and can be used at once or after a simple treatment, although this waste material often has a tendency to discolor the sheets of paper and paperboard.

Chemical Woodpulp

In 1916, a Ministry Commission was created to further the development of the cellulose industry in Italy. This Commission urged that a strong auxiliary industry for increasing paper and paperboard production be developed. It proposed a system of a continuous supply of wood essential for paper and urged that lower overland and oversea transportation rates be arranged. It further advocated an extended forestry program and requested that the Milan experimental station be supplied with necessary funds to make a systematic study of new fibrous materials and to establish the technical and economical possibilities of their use while promoting and extending their cultivation in collaboration with competent agricultural and forest offices. The Commission also recommended a study of plants to be found in Italy and her colonies, which had fibers with properties analogous to those of pine wood. Through research, study and experimentation, therefore, Italy hoped to nationalize the cellulose industry, but by 1936, there were only three cellulose plants in operation, two of which were of the Burgo group; one at Mantova which produced

Figure 7

cellulose from pine and one at Romagnano, Sesia, for rice straw cellulose. The third plant, belonging to S. A. Cartiera di Tolmezzo, produced cellulose from pine.

Papermaking Woods

Poplar wood (Figure 7) has been found to be a most suitable material for the production of cellulose

Figure 8

although it is not used as extensively by the Italian paper industry as is pine wood cellulose. In the absence of other more resistant fibers, poplar will be used more extensively than heretofore. At present, it is just sufficient for the requirements of the mechanical pulp mills. The Corporations for forests, cellulose and paper and the Institute for the Bettering of the Poplar Tree are aiding the forestry program in regard to this species but as the cultivation of the tree is bound to take some years, no immediate contribution to the cellulose problem in Italy can be expected from this source. In Figure 8 is shown the comparable size reached by pine trees after thirty years' growth.

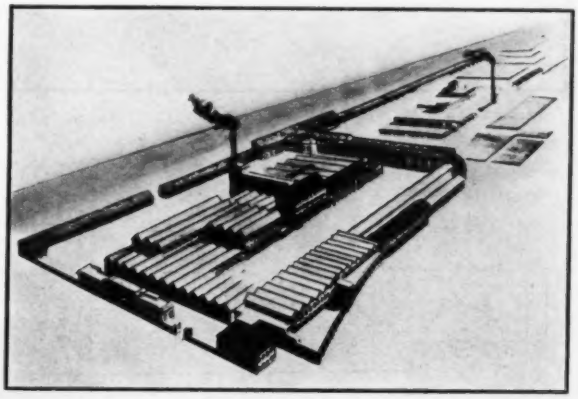


Figure 9

Rice Straw

There have been several attempts to use rice straw to produce cellulose in Italy. In 1870, an attempt was made at Romagnano, Sesia, in the small Carones plant. Pure cellulose was not prepared at that time but rather a raw pulp which was used for yellow straw paper. This mill was turned over to Vonwiller and Company which, after successive improvements, produced fine quantity papers and also poplar cellulose for its own production. Later the mill was absorbed by the Burgo Group which really initiated the preparation of cellulose from rice straw. This field of production has been studied by the Milan experimental station—principally by engineers Rotelli and Stangalini. As a result of the studies and experiments made, the San Giovanni Lupatoto mill at Verona conducted industrial trials. The Burgo Group became associated with this mill and continued the trials with bi-sulphite of calcium and neutral sulphite of soda processes. Added improvements were made in the mill of Romagnano, Sesia (Figure 9) and dry cellulose was produced there at the rate of 2½ tons per day.

Northern Italy produces about 300,000 tons of rice straw per year. This tonnage would be sufficient for about 120,000 tons of cellulose if used in its entirety but it must be remembered that rice straw is used for packing paper, paperboard and even as fodder for domestic animals.

Straw cellulose is used in the bleached condition in papers where high opacity and a certain feel is required. Such pulp cannot be used to make paper of the same strength as that produced from pine pulp. Neither can it be substituted for the usual cellulose employed in producing rayon.

Other Raw Materials

Another raw material for producing cellulose is hemp. The fiber from hemp, however, has peculiarities which prevent it from being used extensively. The Milan experimental station has been studying the possibilities of this material and reports state that it is certain that its use will increase at a later date. Italy produces about 400,000 tons of hemp residue a year.

The broom plant is another raw material which has been used somewhat. This plant has been used for many years for the preparation of cloth and cordage by peasants and recently it has been found to contain a filament similar to jute. In extracting the cortical portion of the plant, a woody residue is left which constitutes a material for mechanical, chemical and semi-chemical pulp.

Other materials now being experimented with by technicians and the Milan Experimental Station for Paper and Fibers are alfa (Lybic esparto), bagasse, chestnut wood residue, tobacco stems, mulberry tree branches and the eucalyptus.

Pump Troubles .. ... Their Solution

W. P. GARGAN, Assistant Chief Engineer
Goulds Pumps, Inc.

Water Pump (Figure 1)

The first sketch ("A") shows a trouble job frequently encountered in pumping service, in which the suction pipe is increased at the pump through a concentric type of increaser on a horizontal run, and which gives an air pocket in the suction line, causing a reduction in the quantity delivered by the pump. This air pocket exists in the top of the horizontal enlarged run of pipe, extending from the smaller inside diameter of the increaser, back to the point at which the suction pipe changes to the vertical and, where the increaser is of one to two pipe sizes larger, this causes an air pocket of considerable capacity. We know of installations of this type where the capacity delivered by the pump was not over 50 per cent of its rating and, in addition, greatly reduced the pressure at the pump discharge.

Below at "B" is shown the correction of this pump trouble. The increaser is made of the eccentric type with the enlargement at the bottom, and which then provides a suction pipe on the horizontal with the upper part of the pipe flushing the top of the smallest diameter of the increaser. This arrangement eliminates entirely the air pocket and permits the pump to deliver its rated capacity and pressure.

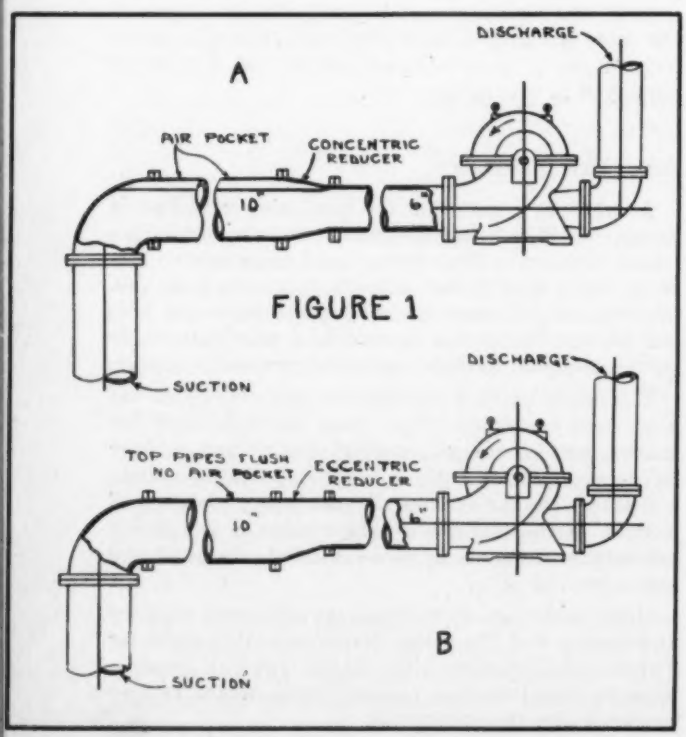


FIGURE 1

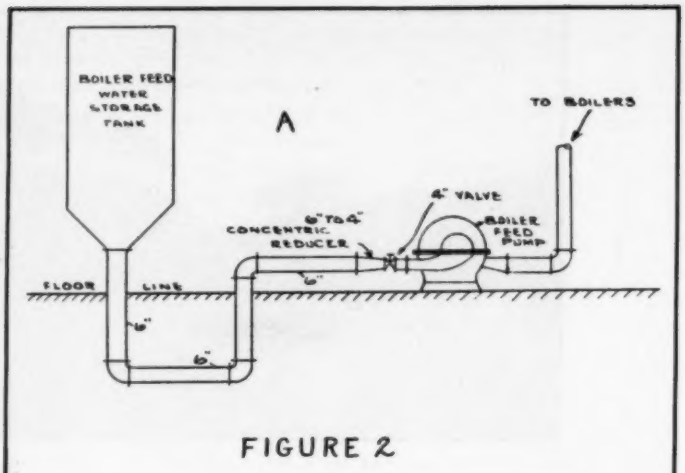
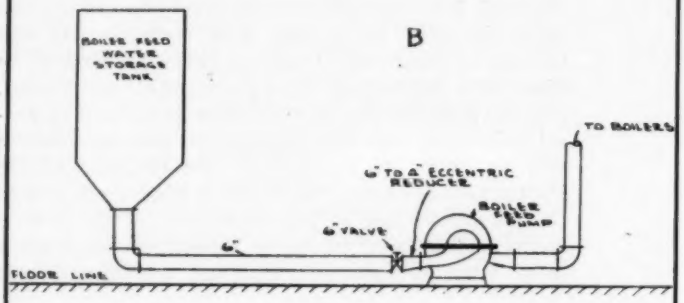


FIGURE 2



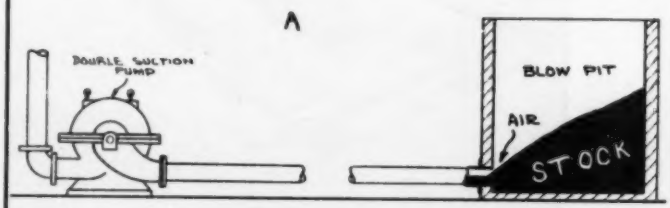
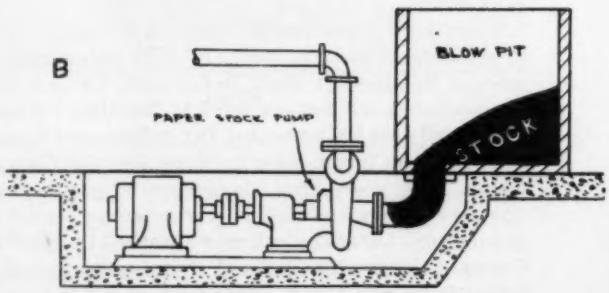


FIGURE 3



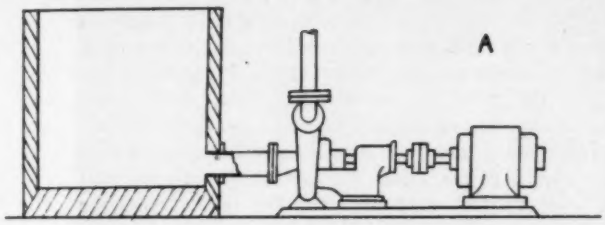
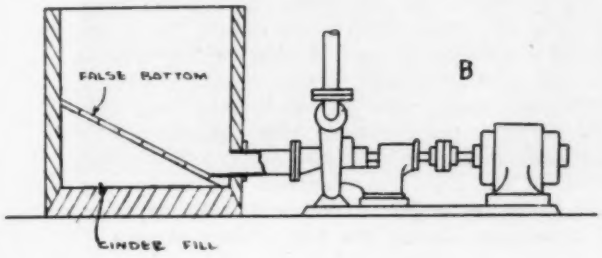


FIGURE 4



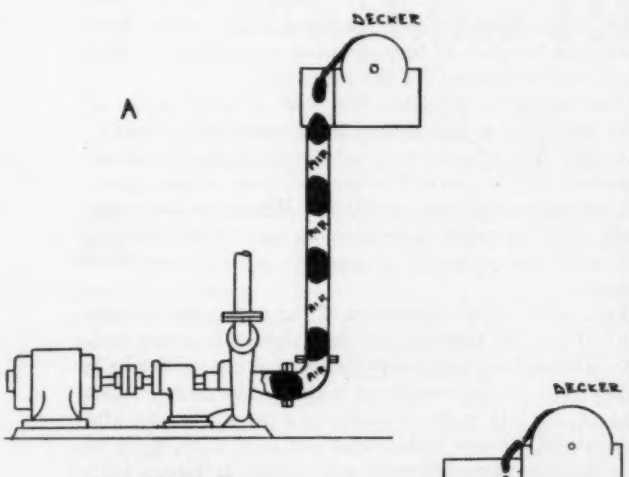
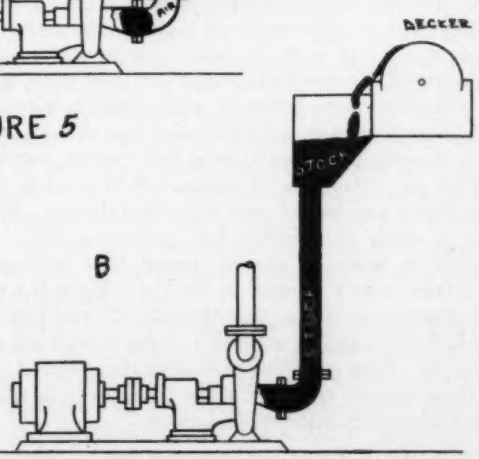


FIGURE 5



Boiler Feed Pump (Figure 2)

Here is illustrated a trouble job encountered in handling boiler feed water. "A" shows the installation as originally made, in which, to avoid other apparatus on the boiler room floor, the suction pipe is carried below the floor level, and then rising vertically to a horizontal line at floor level to the pump, at which point the suction line used a concentric type of reducer to reduce from the 6-inch line to the 4-inch at the pump. This particular installation worked satisfactorily in the beginning as the boilers were operated at less than their rated load, but later when the plant demanded the normal power requirements, it was found that the pump would not deliver its rating.

At "B" is shown the correction of this trouble job which is somewhat similar to "A." The loop in the suction line below floor level was eliminated by carrying the suction pipe horizontally at floor level, and the 6-inch to 4-inch concentric reducer was replaced by one of the eccentric type. Upon the completion of this change, the pump then delivered its rated capacity and pressure. In this case, it was again a question of air trap or pocket in the horizontal run of suction line, and the vertical leg or trap effectively prevented vapor formation from working back up the vertical run of suction pipe to the feed water storage tank.

Paper Stock Pump—
Blow Pit Service (Figure 3)

The first sketch ("A") shows a double suction pump originally installed on blow pit service and which incorporated a long horizontal run of suction pipe, with the pump located at least 30 ft. from the chest. The outlet from the chest and pump were approximately at the same level, which left little or no submergence when the stock level was low in the chest. When the pumping operation reached this point, air was drawn into the suction pipe and, collecting in the top of the suction pipe and pump casing, effectively air bound the pump. When this condition occurred, it was neces-

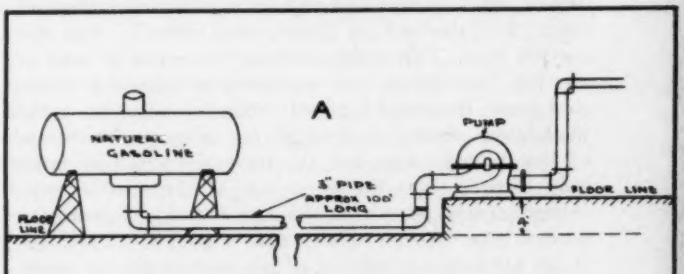
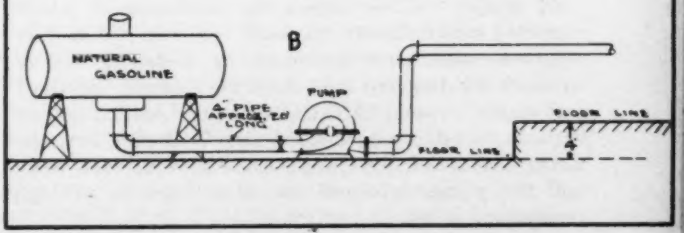


FIGURE 6



sary to direct a large stream of water into the chest and raise its level to again permit the pump to operate.

"B" shows the method by which this trouble was corrected. A regular side suction type of paper stock pump was used, located in a pit below the bottom of the chest with a short and direct suction elbow from chest to pump. This paper stock pump was of the top horizontal discharge type and when this change was made the pump performed entirely satisfactorily and would pump the chest clear down to the bottom. Any air entering the suction pipe at low chest levels was easily discharged from the pump through the self-venting top horizontal discharge nozzle.

Paper Stock Pump—
Decker Chest (Figure 4)

Sketch "A" shows a paper stock pump handling deckered stock of high consistency. This pump was installed on an existing chest with chest bottom and pump floor at the same level. When the chest level was low, it was insufficient to force the high consistency stock into the pump suction and the pump operated at a very reduced capacity towards the end of the run.

"B" shows the correction of this installation. Because of the nature of the ground, which was bed rock, it was impossible to locate the pump in a pit, but this was more or less compensated for by installing a sloping false bottom in the chest, sloping towards the suction connection at the pump, and, while this somewhat reduced the storage capacity of the chest, the pump operated satisfactorily and would pump the chest down.

Paper Stock Pump—
Direct from Decker (Figure 5)

Sketch "A" shows a pump handling deckered stock directly from the decker to the suction pipe of the pump. On this particular installation the decker was located at the floor well above the pump suction, but with little or no storage capacity in the box beside the decker. This stock was of high consistency and dropped from the "doctor" in large slugs directly into the suction pipe. This pump, although previously used in another installation and successfully handling 6 per cent stock, delivered a greatly reduced capacity on the installation shown at the high consistency. The cause of this trouble was that the stock dropping in large gobs directly into the open end of the suction pipe intermittently, permitted the entrainment of air in the suction pipe between each successive gob, which resulted in an air locked condition of the suction piping, when stock was of high consistency. When this occurred, the pump would not handle its rated capacity of high consistency deckered stock.

At sketch "B" is shown the arrangement which corrected this difficulty. A head box over the suction pipe was constructed incorporating a sloping bottom on which the deckered stock from the "doctor" dropped and where it could then slide into the suction piping without entraining pockets of air. With this arrangement, the suction pipe could then fill with solid stock and the pump delivered its rated capacity of high consistency stock.

High Test Gasoline Pump (Figure 6)

Sketch "A" shows a pump as originally installed on handling a high test gasoline from a storage tank through a 3-inch suction piping of considerable length and with the pump proper installed about 4 ft. above the horizontal run of suction pipe in a nearby building. This installation gave but little net static submergence on the pump proper, and during the summer season when temperatures were high the frictional resistance through the suction line and the lack of submergence, were sufficient to cause the gasoline to break vapors and cause the pump to deliver a quantity less than its rating and at times to become vapor bound.

The way in which this trouble was corrected is illustrated in sketch "B." The pump proper was moved over close to the supply tank which located the pump 4 ft. lower than previously and, in addition, the original suction line which consisted of approximately 100 ft. of 3-inch pipe, was changed to 4-inch and a length of only 20 ft. With these changes, which supplied 4 ft. greater static submergence to the pump and a great reduction of the frictional resistance on the suction side, the pump was enabled to deliver its rated capacity at all times even during the hot summer months.

◆ ◆ ◆

Factors Influencing Belt Life*

WHERE short life is experienced with a high-grade belt, let it be leather or rubber, the cause can generally be traced to ignoring factors that influence belt life. First, there are conditions of acid and other fumes, excessive heat, moisture and oil where belts should not be used. If they are used in these places they should not be blamed for the inevitable.

Overloading is probably the most common cause of short belt life. A belt should be selected for the maximum load that it must pull, not the average. The maximum load may be peaks that occur during normal operation, or severe starting conditions. Whatever the cause, peaks must be taken into account and a belt selected with sufficient capacity to operate without excessive tension.

Next to the proper selection of the belt is its installation. Wherever possible, the belt should be made endless. Methods are now available for making rubber belts endless almost as readily as leather. No matter what type of joint is used, it must be properly made and maintained. Renew fasteners when they show signs of serious wear; worn fasteners make joints break and tear.

Although proper selection and installation are the most important factors in good belt service, just as they are for any other type of equipment, it must be given a reasonable amount of care after installation. Run the belt as slack as possible and yet avoid slip. Mount motors on bases of correct design that automatically maintain correct tension in the belt. Keep the pulleys and shafting in line so that the belt will run true. Keep the belt clean and, if necessary, treat it with a good belt dressing. Keep oil from getting on the belt. Attention to these factors will pay many times over in increased belt life and uninterrupted service.

(*) Taken from "Here's Long Life to Your Belts," in November, 1937, issue of *Power*.

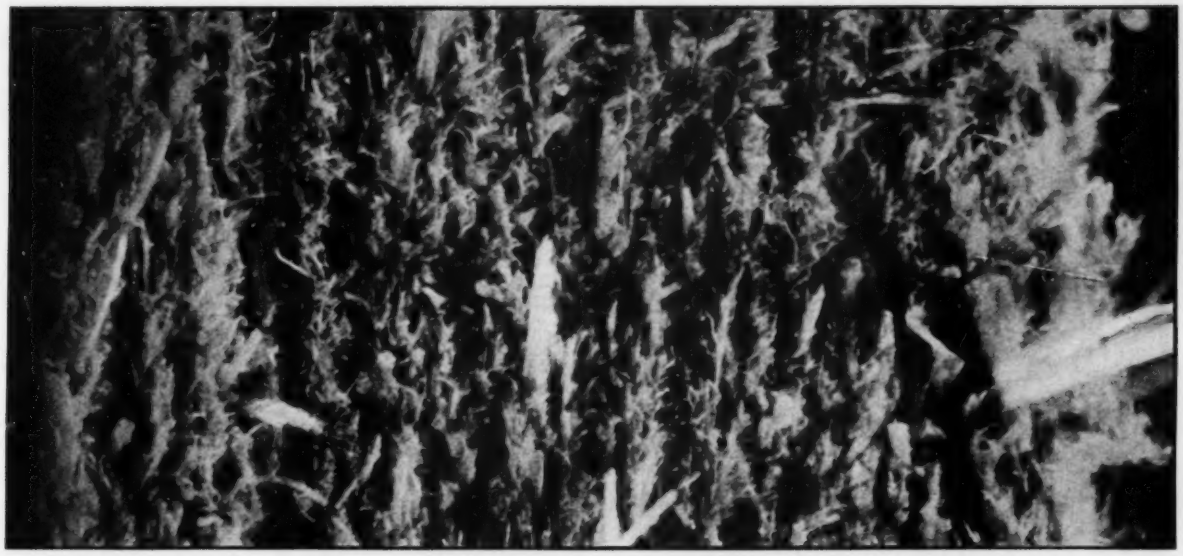


Fig. 1—Cross section of board made on a cylinder machine

Development of Forming Machine for Insulating Board

L. K. ARNOLD, Associate Chemical Engineer
Iowa Engineering Experiment Station, Iowa State College

A FORMING machine for the efficient production of high grade insulating board of necessity differs from a conventional paper forming machine because it must produce a product which differs in many respects from paper. One of the most obvious difference is in thickness. Even the so-called "boards" of the paper industry are far thinner than the $\frac{7}{16}$- or ½-inch insulating board. The pulp used in insulating boards is less highly refined, less hydrated, and much less uniform in particle size than paper pulp. As a result of these characteristics of the pulp and the much greater thickness of the finished board, the strength of insulating boards is not secured alone by the adhesion of fibers to each other because of hydration but also by the interlacing effect of the long fibers. The structure of the board is more porous than paper so that enough air films may be incorporated to secure adequate heat insulation.

In the experimental production of cornstalk insulating board in the Engineering Experiment Station laboratory at Iowa State College, a cylinder type of forming machine was first used, consisting of a single wire covered cylinder revolving in a vat of pulp. Suction was applied in compartments of the cylinder in such a manner that a mat of board was being built up on the surface for that part of the cylinder which was immersed. As the mat-covered portion of the cylinder emerged from the vat of pulp, the vacuum was cut off and the mat stripped off by a doctor plate. The main disadvantage of this type of forming machine from the standpoint of operation, was the narrow range of pulp freeness to which it was limited. In actual plant operation it may be necessary to vary the freeness in the production of boards slightly different in their characteristics from standard board. For example roofing board is frequently produced from freer pulp than standard building board. If pressed board is produced in the same plant it will usually require a slower pulp.

When a board is formed on a cylinder machine one surface is longer than the other because of the curvature. On a six foot cylinder, for example, with a board mat 1.25 inches thick (to produce a finished board 0.5 inch thick) the upper surface will be 2.5 inches longer in 6 feet than the lower surface. When the mat is flattened out in the presses the fibers must be formed into a re-arrangemnt to correct this condition. Any such re-arrangement of fibers at this stage of the board formation tends to weaken the board.

Another objection to a board produced upon a cylinder machine is that it may be laminated. This is particularly true of boards formed on a multicylinder machine. These boards tend to split along the line

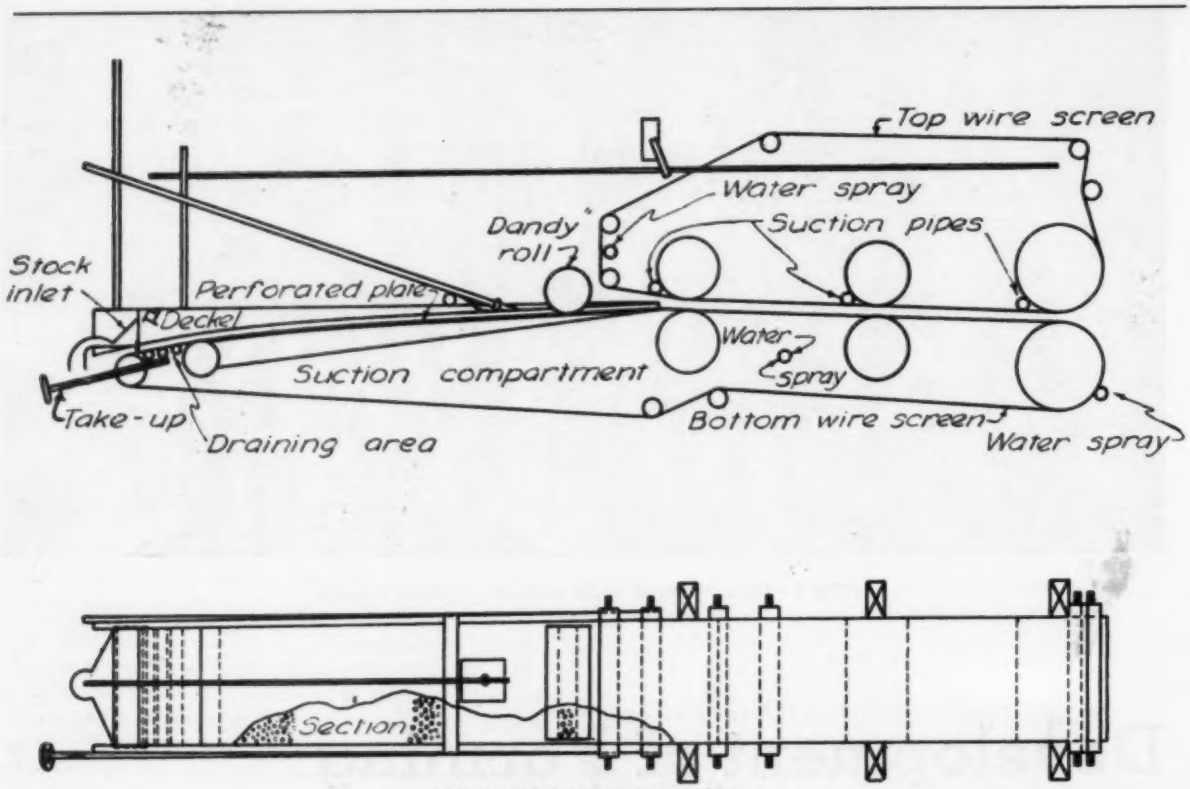


Fig. 2—Original forming machine

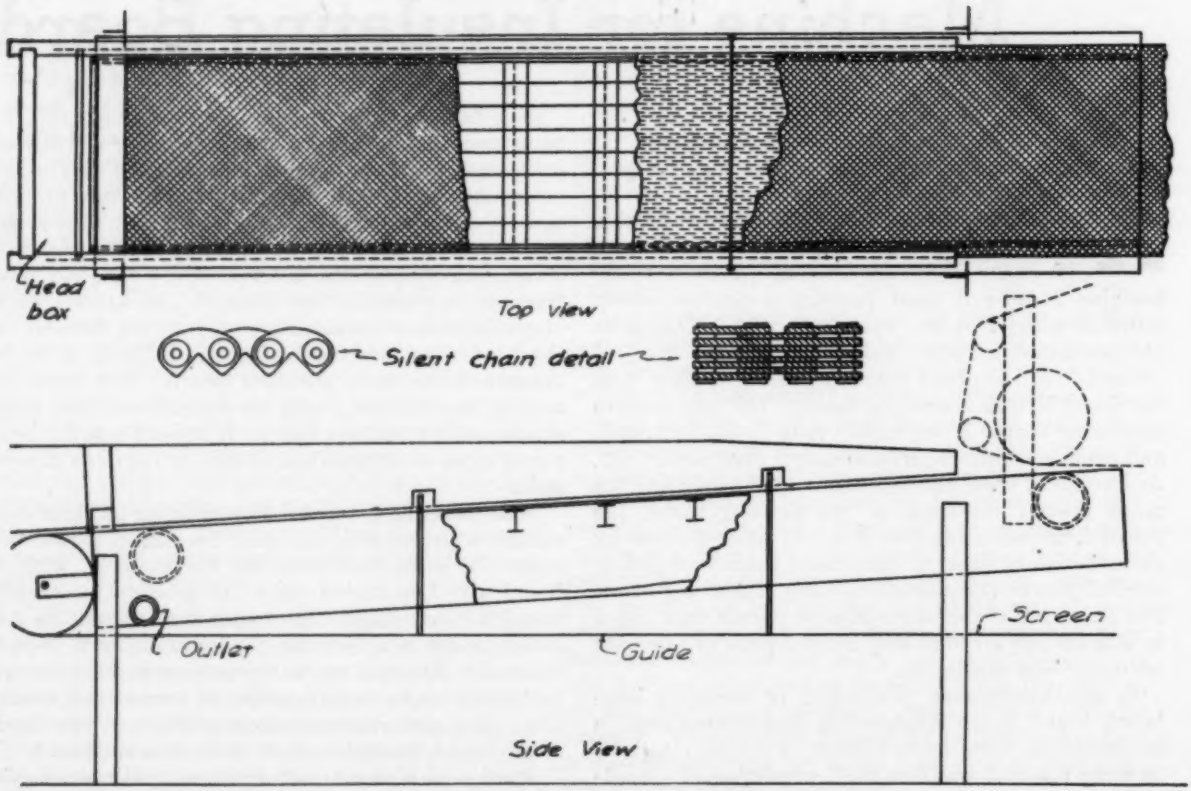


Fig. 3—Improved forming machine

where the several mats are pressed together to form the final mat going to the press rolls. Even in a single cylinder machine considerable lamination is likely to occur since the fibers are deposited more or less in layers. This layer like arrangement with their long axes lengthwise of the board is shown in Figure 1, which is an enlarged cross section of a commercial board produced on a cylinder machine.

It would seem that the ideal fibre arrangement in a board would be a miscellaneous inter-twining of fibers through the body of the board with the fibers near the surfaces substantially parallel to the surface but with their long axis arranged in all directions. This would tend toward greater strength in the body of the board to resist stresses in tension and would tend to a more porous internal structure with high heat insulating properties because of air films present. The surface

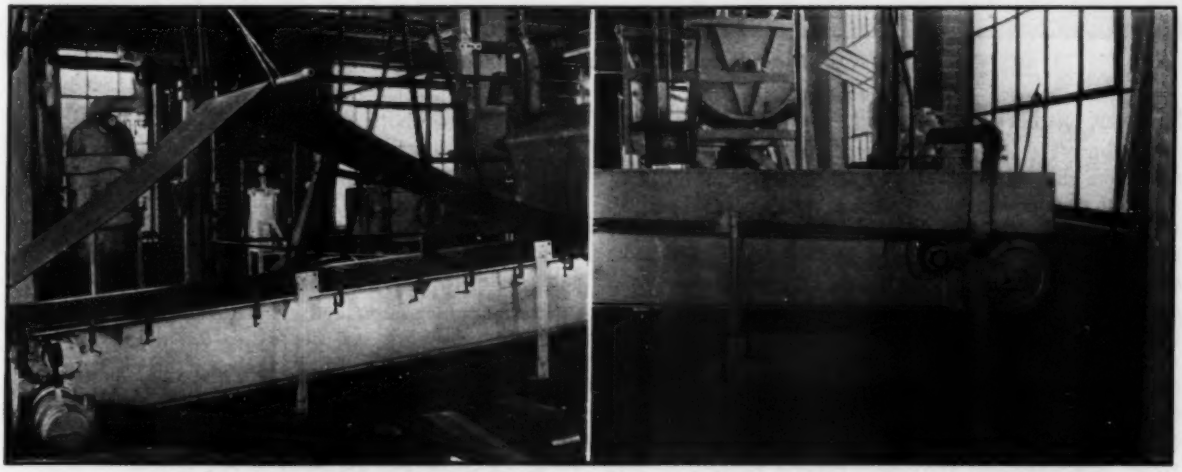


Fig. 4—(left) Improved forming machine. Side view with deckle boards removed and wire raised. Fig. 5—(right) Improved forming machine. Side view at wet end

arrangement of fibers would tend to give high outer fiber strength with resultant high transverse breaking strength (modulus of rupture), would tend to give a less porous surface reducing air infiltration and moisture absorption, and would give a good appearance.

A forming machine which it was believed would produce a board with the characteristics enumerated was designed and built. This machine (Figure 2) had as its basis a steel suction box 30 inches wide by 8 feet long with a perforated curved top. The rear rounded end of this box was formed of a portion of six-inch pipe to which the top, bottom, and sides of steel plate were welded. The box tapered down to zero inside thickness at the dry end (next to the press rolls). A pair of wooden deckle boards with rubber deckle straps and a wooden head box formed an open vat on the top of the suction box. Since the rear end of the suction box was set lower than the dry end the vat was deeper at the rear end, varying from about 12 inches to 3 inches in the length of the machine.

A continuous wire screen passed over the top of the suction box beneath the deckle straps and between three pairs of press rolls. As first operated the screen merely slid over the smooth top of the suction box being driven from the last press roll. Later a metal roll was placed at the rear end of the box, although the screen still slid over the top surface of the box. The pulp was pumped into the head box from which it flowed onto the suction box, forming a pool at the rear end from which the screen was continually emerging. Water was sucked out along the length of the box reducing the moisture content of the pulp from about 97.5 to 85 per cent.

While a 30-mesh phosphor bronze wire of standard square mesh gave good results, it was found that better results were secured with a special 10-mesh right hand spiral weave screen of No. 22 gauge stainless steel with floating reinforcements spaced at every spiral. The spiral weave screen showed a longer life because of freedom from flexing in the wire as it passed over the tightening rolls.

Although this machine operated excellently, an improved form was designed and built to eliminate the friction loss resulting from drawing the wire screen under suction over the top of the suction box. In the new machine (Figures 3, 4, and 5) the wire screen was carried along on a silent chain two feet in width forming the top of the suction box. This chain, which was continuous, was driven by a gear at the press roll end and idled over another gear at the opposite end. The upper part of the chain which supported the wire screen was in turn supported by longitudinal steel strips set upon edge on steel I-beams running cross-wise inside the suction box. The screen used was similar to that used on the other machine.

In the first machine the wire screen was driven by the press roll next to the drier and merely slid over the surface of the suction box. In the improved type it was driven by both the press roll and the supporting chain so that the two had to be synchronized in speed. The use of the supporting chain made it possible to run at a higher vacuum, thus allowing the use of slower pulps. Both machines described were constructed for experimental purposes and produced a board only two feet wide. A machine of the first type,

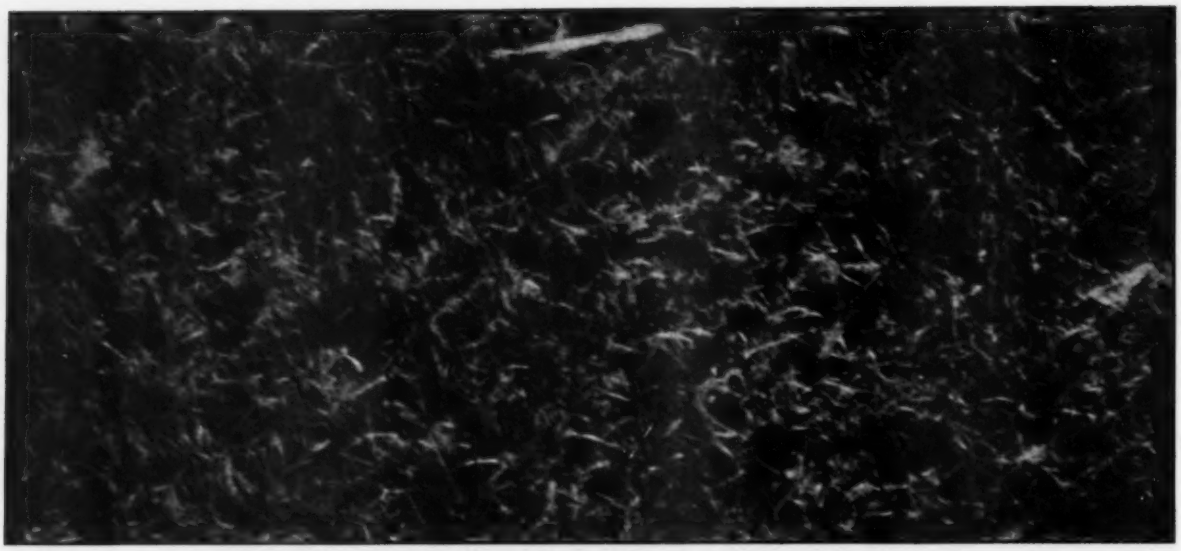


Fig. 6—Cross-section of board made on new forming machine

however, has been in successful commercial operation.

To show the difference in the formation of boards made on this type of machine and upon a cylinder machine, enlarged photographs, (Figures 1 and 6) were made of cross sections of commercial boards made on the two types of machines. In the board produced on the cylinder machine (Figure 1) the fibers are in a regular and layer like formation with very little interlacing. In the board produced on other machine (Figure 6) the fibers are in a miscellaneous tangled formation with much interlacing. As the pulp flows onto the machine it is in violent state of agitation with the fibers arranged in all directions. As the water is sucked out the fibers remain largely in this position. Near both surfaces (not shown in the cross section) the fibers are flattened out so as to lie with their long axes more or less parallel to the surfaces. There is no machine direction to the surface fibers, transverse tests made on pieces cut crosswise and lengthwise of a given board showing substantially the same modulus of rupture.

The machines described were developed as a part of the research work on the utilization of agricultural by-products by the Iowa Engineering Experiment Station, Iowa State College, Ames, Iowa (formerly in co-operation with the National Bureau of Standards) and are covered by U. S. Pat. 1,814,268 issued to O. R. Sweeney and assigned to the college.

Motor Cleaning with Solvents*

DRY-CLEANING methods are widely and successfully used for motors, when the accumulation of dirt contains grease or oil. Three solvents are most common: gasoline or benzine, carbon tetrachloride, and a mixture of the two. All are sufficiently active and the choice should depend upon a consideration of two factors: gasoline or benzine presents a fire hazard; carbon tetrachloride is not combustible but gives off fumes that, in the absence of good ventilation, are dangerous to life. A mixture of the two gives off less fumes and is much less likely to catch fire, and hence is often used. A mixture of half carbon tetrachloride and half benzine, or a mixture of carbon tetrachloride and gasoline in the rates of 60 to 40 is non-inflammable but the vapors are explosive when combined with the right proportions of air. The hazard, however, is much less than when using gasoline or benzine alone.

When using any of the cleaning fluids, circulation of good air is essential, in the case of gasoline or benzine, to prevent the accumulation of explosive gases, and in the case of carbon tetrachloride to prevent injury from poisonous fumes.

Carbon tetrachloride should be used alone only when the fire hazard is great. The toxic gases from carbon tetrachloride sometimes takes effect before their presence is realized. For this reason a workman should not be permitted to work with it alone, as two men are not likely to be overcome simultaneously.

All solvents should be used sparingly and thoroughly removed from the machine when the job is done. Sponges or cotton rags dipped in the solvent should be used for the actual cleaning and the machine afterwards wiped dry. A paint brush dipped in the cleaning fluid helps get into corners and crevices. The solvent can also be sprayed on with a spray gun, atomizer, or even a blow torch, although the latter produces a stream at higher pressure than is desirable. If left on insulation too long gasoline or benzine may soften the varnish. Carbon tetrachloride is an active solvent but somewhat corrosive so no surplus should be left on machine parts. On no occasion should an electrical machine part containing insulation be permitted to get thoroughly soaked by cleaning fluid such as would occur if the part were dipped into the liquid.

(*) Excerpted from article "Cleaning Electrical Apparatus" by Dick Edgebrooke, published in March, 1937, issue of *Electrical Maintenance*.

Bending Moments at the Corners of Bins and Chests

CHAS. A. MARTIN

PAPER-MILL engineers frequently have occasion to design stock chests of reinforced concrete, and where such a chest is high it is more economical to design for horizontal reinforcing than for cantilever reinforcing from the bottom.

With all four walls of a chest of equal thickness, and therefore with the same moment of inertia, a simple calculation will show complete fixation of the corners only when the chest is square. Similarly, if the sides are longer than the ends, a simple calculation will show that the longer span has a greater fixed end moment than the shorter span. The deformation that takes place, when a chest is constructed and loaded, balances this corner condition. Cracks, however, will occur if the chest is not properly reinforced.

The bending moments in the four corners of a rectangular chest must be equal. A value of the corner moment may be obtained by the method of conjugate points (Trans. A. S. C. E. Vol. 90) as follows:

Lay out simple span bending moments and determine the T1-2 point, then draw a horizontal line through this point for the closing "M" line (see illustration).

The corner moment Mc may be scaled directly from this graphic construction or analytically determined from the diagram.

$$M1 = \frac{WL1^2}{8}; \quad M2 = \frac{WL2^2}{8}$$

$$\frac{2}{3} M1 = \frac{wL1^2}{12}; \quad \frac{2}{3} M2 = \frac{wL2^2}{12}$$

$$\left(Mc - \frac{2}{3} M2\right) : \left(\frac{2}{3} M1 - \frac{2}{3} M2\right) = \frac{L1}{3} : \frac{L1 + L2}{3}$$

substituting and solving

$$Mc = \frac{w}{12}\left(L1^2 - L1\ L2 + L2^2\right)$$

As an example consider a chest 10 feet long by 5 feet wide. The value of w will, of course, depend upon the depth from the surface of the stock in the chest.

$$Mc = \frac{w}{12}\left(\overline{10}^2 - [10 \times 5] + \overline{5}^2\right)$$

$$= \frac{75}{12} w \ \# \text{ ft.}$$

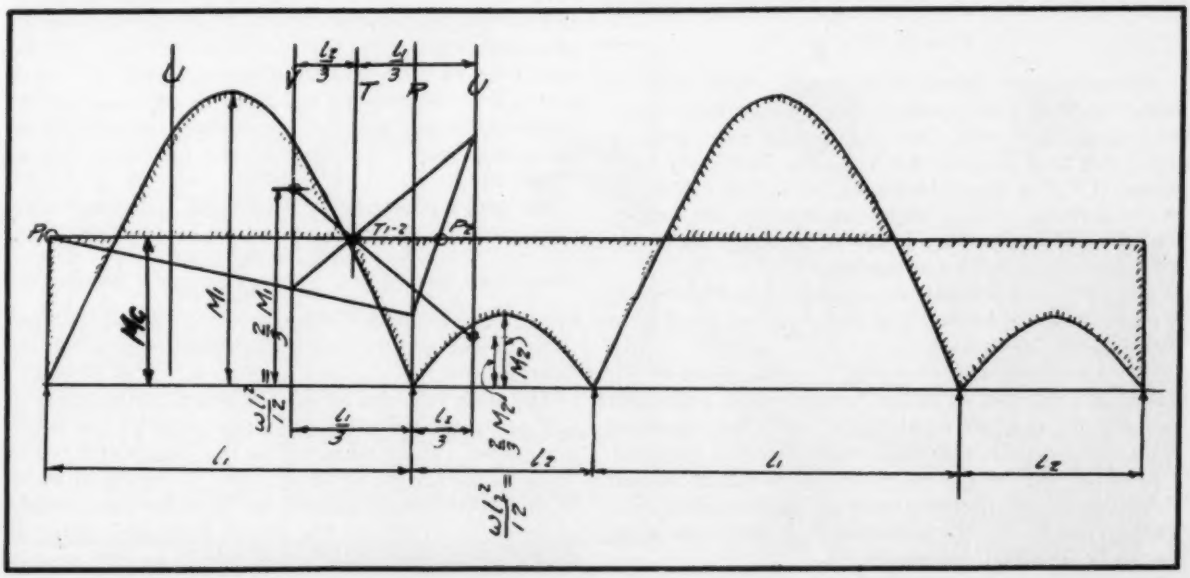
Should the long side only be considered then:

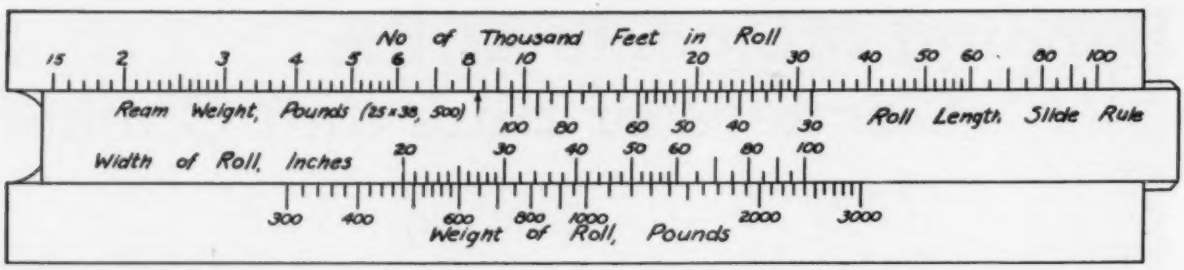
$$Mc = \frac{100\ w}{12}$$

Considering the short side only, then:

$$Mc = \frac{25}{12} w.$$

An interesting point to note in a chest of this proportion is that there is no positive moment in the end walls.




No of Thousand Feet in Roll
15 2 3 4 5 6 8 10 20 30 40 50 60 80 100
Ream Weight, Pounds (25 x 38, 500)
100 80 60 50 40 30
Roll Length Slide Rule
Width of Roll, Inches
20 30 40 50 60 80 100
300 400 600 800 1000 2000 3000
Weight of Roll, Pounds

Roll Length Slide Rule

D. S. DAVIS, Chemical Engineering Department
Wayne University

THE most satisfactory method of calculating the length of paper in a roll makes use of the following data:

W, the net weight of paper in the roll, pounds
b, the width of the roll, inches
B, the ream weight of the paper, pounds per ream
A, the total area of paper in the ream, square feet
L, the unwound length of paper in the roll, thousands of feet. The weight of paper in pounds per square foot is in quotient of W and the area, $\frac{1000\,L\,b}{12}$ or $0.012\frac{W}{L\,lb}$. It is also the quotient of B and A or $\frac{B}{A}$. Equating and solving for L,

$$L = 0.012\,\frac{W\,A}{b\,B}.$$

The area, A, depends upon the ream dimensions: length, width and number of sheets. In the case of a ream 25 in. by 38 in., 500 it is $\frac{25 \times 38 \times 500}{144}$ or 3299 square feet so that the length expression becomes

$$L = 39.58\,\frac{W}{b\,B}.$$

When frequent calculations of roll length must be made one should be provided with an alignment chart or a special slide rule. An alignment or nomographic chart for this purpose having been previously presented (Cf. THE PAPER INDUSTRY, 13, 9, 1101 (1931)) it is the purpose of this paper to describe the mathematical and mechanical design of a simple slide rule intended solely for this computation.

Since the formula calls for a series of multiplication and division operations, it is well adapted to solution by means of logarithms,

$$\log L = \log 39.58 + \log W - \log b - \log B$$

and hence capable of being handled by a slide rule bearing the familiar logarithmic scales but arranged in a manner such that only one setting is required. The scales can be placed in several positions as best determined by experimenting with paper models. The positions shown in the accompanying figure are satisfactory and permit symmetry.

Suitable ranges of data are

W, 300 to 3000 pounds
b, 20 to 100 inches
B, 30 to 100 pounds per ream
L, 1.5 to 100 thousands of feet

while a convenient modulus or length of scale corresponding to unity in plotted function is 12.5 cm., enabling the scales to be laid off by means of the A or B scales of an ordinary ten-inch slide rule. The scale lengths are:

$$W,\ 12.5 \log \frac{3000}{300} = 12.5 \text{ cm.}$$

$$b,\ 12.5 \log \frac{100}{20} = 8.8 \text{ cm.}$$

$$L,\ 12.5 \log \frac{100}{30} = 22.8 \text{ cm.}$$

$$B,\ 12.5 \log \frac{100}{1.5} = 6.5 \text{ cm.}$$

so that a 9¾-inch slide rule blank is sufficiently long. The scales are laid off in ink on heavy white photographic paper, mounted on the blank with glue, and varnished. The W, b, and L-scales are centered, as shown, while the B-scale is placed in a position such that the roll length equation is satisfied.

The use of the slide rule is illustrated as follows: What is the unwound length of a roll of paper weighing 1300 pounds when the width is 54 inches and the ream weight is 50 pounds (25 in. by 38 in., 500)? Set 54 on the width scale over 1300 on the roll weight scale and over 50 on the ream weight scale read the desired unwound length as 19,000 feet. Had the ream dimensions been 24 in. by 36 in., 480, what would the length have been? Set 100 on the ream weight scale under 19,000 on the length scale as previously found and over the arrow read the length of the unwound roll as 16,600 feet.

The arrow is located at B = 114.5, found by multiplying 100 by the ratio of the products of the ream dimensions, or $100 \times \frac{25 \times 38 \times 500}{24 \times 36 \times 480}$. Similar arrows can be added for other ream definitions, the positions of the arrows being calculated in exactly the same manner.

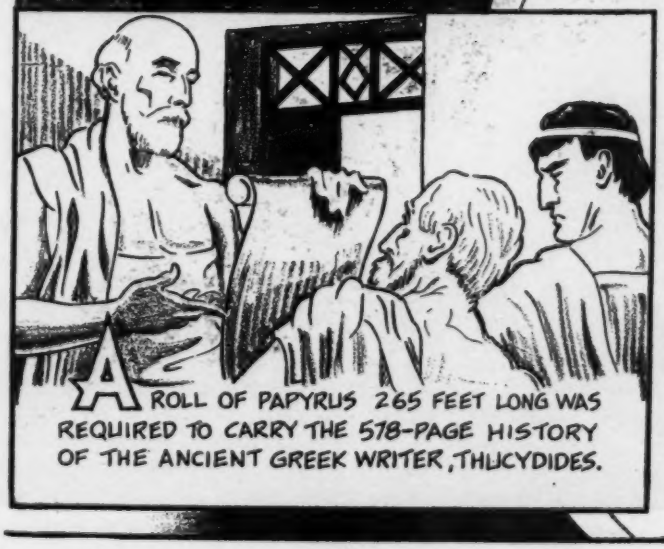
The slide rule can be used to compute the value of any one of the variables when the values of the others are known. Thus, what will be the weight of a roll of 56-lb. paper (25 in. by 38 in., 500), 75 inches in width when 17,000 feet are wound? Set 56 on the ream weight scale under 17,000 on the length scale and under 75 on the width scale read the roll weight as 1800 pounds.

Paper Sketches ---

AIR CUSHIONS OF PAPER HAVE BEEN MADE AND USED BY THE JAPANESE FOR CENTURIES. THESE CUSHIONS, MADE OF 6 OR 8 SHEETS OF TISSUE-THIN BAMBOO-FIBER PLY-PAPER, LAID CROSSWISE ALTERNATELY, AND CEMENTED TOGETHER WITH FLEXIBLE SHELLAC, WHEN INFLATED, SERVE AS PILLOWS AND BEDS. WHEN NOT IN USE THEY CAN BE FOLDED UP INTO SMALL, COMPACT PACKAGES.

AS EARLY AS THE 1780'S A FACTORY WAS SET UP IN FRANCE TO MAKE OUT OF PASTEBOARD SUCH ARTICLES AS FURNITURE, VASES, VEHICLES, VESSELS, ETC.

IN GERMANY, ORDERS RECENTLY WERE ISSUED REQUIRING EVERY BERLIN HOUSEHOLDER TO COLLECT ALL WASTE PAPER IN RECEPTACLES PROVIDED FOR THE PURPOSE AND TO DELIVER SUCH PAPER REGULARLY TO OFFICIAL DEALERS.



A ROLL OF PAPYRUS 265 FEET LONG WAS REQUIRED TO CARRY THE 578-PAGE HISTORY OF THE ANCIENT GREEK WRITER, THUCYDIDES.

TAPPI Meets in Savannah

A MOST successful meeting of the Technical Association of the Pulp and Paper Industry was held on October 18, 19, 20, 1937, in the De Soto Hotel, Savannah, Ga. This meeting, the first of the Association to be held in the deep South, featured a well-arranged technical program, several interesting and helpful sightseeing trips, and a program of entertainment that savored deeply of the genuine hospitality of the "Old South."

Southern Wood Supply Symposium

The convention opened on the morning of October 18 with a technical session in the form of a symposium on southern wood supply and over which C. W. Boyce, Secretary of the American Paper and Pulp Association, presided as chairman.

Findings of Southern Forest Experiment Station

The first paper of this symposium, a paper entitled, *Forest Situation in the Lower South*, was the subject of I. F. Eldredge, Regional Survey Director, U. S. Forest Service, Southern Forest Experiment Station. In this paper, Mr. Eldredge reviewed the findings of the survey recently made by the Southern Forest Experiment Station of the timber resources of the South and pointed out the need for sound forest management policies if the forests and the industries which they serve are to be perpetuated.

Mr. Eldredge stated, in part, that the survey of the South's forest resources got under way in 1932; that the field work of the survey in the lower South, except for the post oak country of Texas and Oklahoma, was finished a little over a year ago; that the larger and much more time-consuming job of converting the field data into usable information for publication and its integration in a thoroughgoing economic study of the situation is still underway; that from half to more than four-fifths of the land area in twenty-two out of thirty-one survey units is in forest growth and that eight of the nine remaining units are nearly half forest; that the proportion of forest land is greatest in the survey units bordering the Atlantic and Gulf Coasts and in several of the units lying west of the Mississippi; and that considering the lower South as a whole, forest growth in some stage occupies 59 per cent of the land area, agriculture 35 per cent and other uses 6 per cent.

Mr. Eldredge divided the lower South into four major forest regions; namely, naval stores, pine-hardwood east, pine-hardwood west, and delta hardwood regions. In further reference to these regions, he said that the naval stores region has a forest area of 45 million acres, that of the pine-hardwood region (east) of 36 million; that of the pine-hardwood region (west) of 31 million; and that of the delta hardwood region of 13 million acres.

Considering all forest conditions in the pine types only, he continued, the average stand of pine per acre is 4.7 cords in the naval stores region, 7.7 cords in the pine-hardwood east and 8.5 cords in the pine-hardwood west. In all three regions, commented Mr. Eldredge, from a forest management standpoint, a considerable portion of the volume in trees under 13 inches could advantageously be removed in thinning over dense stands and utilized for pulpwood. Likewise, he suggested a similar use for the top stems of trees cut for saw timber and other purposes.

Some of the delegates who attended the fall meeting of the Technical

Mr. Eldredge also called attention to the accumulation of longleaf and slash pines of small size in the naval stores region—trees which have been worked out and abandoned for turpentining and which should be removed to free the ground for a new crop of trees.

The total numbers of forest industry establishments of all kinds—lumber, naval stores, pulp mills, and others—in the thirty-two survey units of the lower South, cited Mr. Eldredge, approximates 10,000. Over four-fifths of this total, he said, depend primarily on southern pine for their timber supplies.

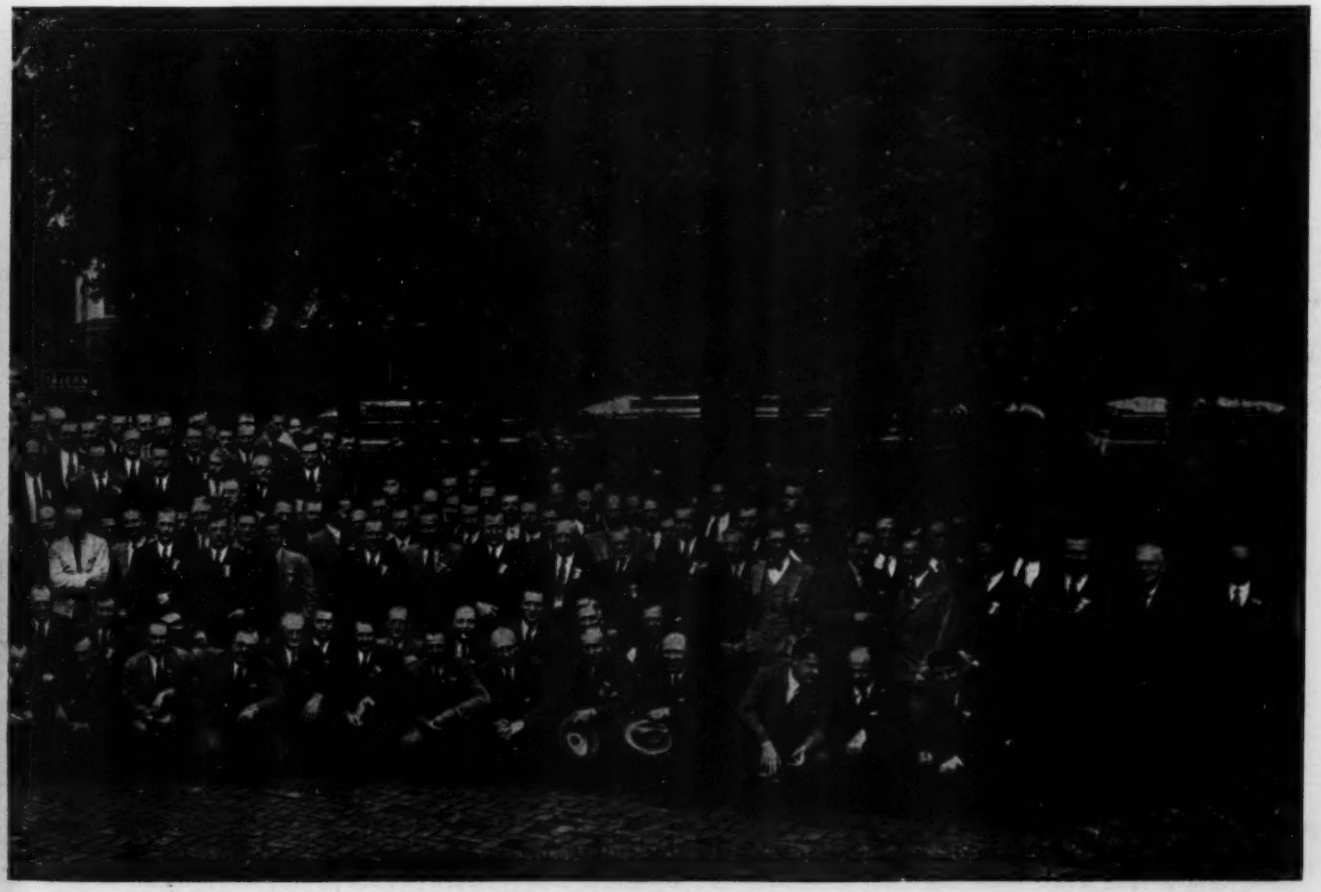
Mr. Eldredge added that the location of additional large mills in the naval stores region at this time undoubtedly will threaten the future supply of the lumber, pole, tie and turpentine industries and perhaps endanger their own future prospects; that timber growing, as an economic enterprise, is only possible where markets and manufacturing facilities are both localized and stable, and where all the products of the forest, minor as well as major, can be turned into profit; that steady markets have developed for the products from second-growth timber and these markets have broadened to include nearly all sizes, qualities and species of trees; that no longer must the forest-using industries be transitory enterprises forever uneasily preoccupied with an uncertainty as to future supplies of raw material; that in all parts of the South there are vast areas of already stocked pine and hardwood forest lands which invite the investment of capital in their assembly, organization and development as permanent plants for the production of low cost forest products; that the South heartily welcomes the remarkable recent expansion of the pulp and paper industry; that the public has, to a large degree, become forestry minded and cannot be expected to long remain friendly to any industry that threatens the continuity of its forest assets; that intelligent self-interest in the protection of huge plant investments inevitably will lead to the acquirement of adequate forest lands by each concern, to the practice of sustained yield forestry on them and to the encouragement of equally good forestry on the lands of others tributary to the mills; and that if the pulp and paper industry lives up to these expectations and distributes its plants with full regard of existing and expected timber requirements of competing industries, the industry has room for further expansion in the South without fear as to its future timber supply.

Multiple Use Timber Crop Recommended

The second paper of the symposium on southern wood supply was entitled, *Relationship Between Pine for Pulpwood, Saw Timber and Naval Stores,* and was the subject of A. E. Wackerman, industrial forester, Seaboard Air Line Railway.

Indicative of the rapid progress made by forest-owning lumber companies toward growing their own timber, commented Mr. Wackerman, is the fact that a dozen or more already practice selective cutting and harvest only trees that have been marked by trained men with particular emphasis being given to leaving a properly spaced stand of growing timber behind logging that will permit selective cutting at intervals of 10 or 15 years. Pulp companies by the acquisition of large areas of forest land tributary to their plants, he added, obviously also have accepted the premise that it is advisable to own and manage substantial areas of forest land to eliminate any question as to their future pulpwood supplies.

Mr. Wackerman also said, in continuing his remarks, that the naval stores industry, probably because, as a rule, it utilizes trees for only a few years and because the majority of the units are small, is not generally a forest-owning industry; that the prospects of continued and increasing demands for southern pine products make it obvious that each major unit of the forest industries must protect itself from excessive competition for wood,



Association of the Pulp and Paper Industry at Savannah, Georgia

not only from other industries but from other units of the same industry; that much of the acreage being acquired for large holdings will require several years of fire protection and stand improvement, such as thinning and the removal of mature and worthless trees obstructing the growth of others, before it will be in condition to permit regular harvest cuttings; that intensive forestry is entirely practicable on the larger properties and that forests so owned and varying upward from 30,000 acres in size justify full time forestry supervision and that an annual yield of 500 board feet of saw timber and one cord of pulpwood per acre as a by-product is not at all an unreasonable expectation on good sites when intensive forest management is justified by markets that permit complete utilization of all trees grown.

Mr. Wackerman, in emphasizing the feasability of utilizing thinnings and logging waste for pulpwood, cited the experiences of several lumber companies, one of which, a concern practicing intensive forest management on a large area of shortleaf and loblolly pine timber, produces 500 cords of pulpwood a month from thinnings and salvage cuttings behind logging and could produce much more as a by-product of the company's timber growing program if the market needed it. Another company operating in shortleaf and loblolly pine, he said, averages from 4 to 6 units (5 foot cords) per acre from thinnings in stands of various ages. Still another lumber company in the shortleaf loblolly pine region, a company which has experimented with salvage cutting for pulpwood behind logging in co-operation with its State forestry agency and a pulp and paper company, has found that in second-growth timber an average of 1½ cords of suitable wood per acre could be obtained but that the cost exceeded the returns.

Mr. Wackerman also made reference to a lumber company operating on longleaf pine which, for some time, has been converting the tops of saw-logs trees into pulpwood, and obtains an average of ⅓ of a unit (5 ft. cord) per acre from light stands. He also stated that forests managed primarily for naval stores probably will yield but little if any saw-timber because the round timber above the faces will be small when the trees are worked out and because trees with large crowns and short trunks, which are desired for turpentining, are not as a rule useful for lumber; that pulp mills have the opportunity to obtain substantial amounts of pulpwood from lumber company and naval stores forests when the price for wood is such that the owners can obtain a reasonable return from the operation; that, sooner or later, it will be found advisable for pulp company forests to be managed for diversified timber products because of the much greater financial returns that will be possible; that it is doubtful if pulpwood will ever be scarce unless pulp production increases materially; that both lumber companies and pulp companies cannot afford to overlook the opportunity to dispose of the naval stores value in their timber when longleaf and slash pine forests are involved; and that, while the expanded demand for southern pine timber might give the appearance of intense competition between forest users, this condition need not develop because saw timber, pulpwood and naval stores are supplemental in their demands on pine forests.

Pulpwood Costs Analyzed

Cost of Pulpwood at Southern Mills was the subject of the third paper of the symposium. This paper, presented by William L. Hall, Consulting Forester, touched upon processing, delivery, and stumpage costs as well as upon the trend of costs during the past decade, future trend of costs, and the cost of growing pulpwood in the South.

Mr. Hall stated, in part, that the length of stick is generally 5 feet, but most operations west of the Mississippi River, and some of those east of the Mississippi, use 4½ foot wood; that costs of cutting in 1937 have ranged from 75 cents to $1.25 per unit of 160 cubic feet; that the most common rate, especially in the east, appears to be $1.25; that peeling is not generally practiced but it required in certain operations; that the cost of peeling is about 75 cents per unit; that truck delivery of wood is the most common method for distances within 30 miles of plant; that the present average truck haul is about 20 miles; that the cost of delivered wood, excluding stumpage, may be said to run from $3.25 to $5.00 per unit, with an average not far from $4.00; that, at midyear 1937, a summary of wood costs at mill revealed a range of $3.75 to $6.25 and an average of somewhere near $5.00 per unit of 160 cubic feet for truck wood, an average of near $6.25 for railroad wood, and an average of about $5.75 for barge wood; that improved roads, improved trucks and other equipment, improved organization and methods, increased skill in labor, increased percentage of truck and water shipments, lower handling costs by lengthening the stick, and lower stumpage have resulted in a reduction in costs of pulpwood of some 23 per cent during the past decade; that higher taxation, higher labor, and higher stumpage almost certainly will tend to increase the cost of pulpwood; that competition will be the largest factor in determining stumpage values; and that free play of competition between the saw mills, cooperage plants, tie makers, pole cutters, naval stores operators and pulp mills will be sufficient to raise the price of pine stumpage to a point where the growing of crops of pine timber will be increasingly attractive in many districts.

In discussing the cost of growing pulpwood in the South, Mr. Hall related that the cost of land suitable for growing pine pulpwood or other pine products has not changed much in the past ten years; that in 1927, land carrying 3 or 4 cords of pulpwood per acre, except in the main naval stores region, could be bought for $4.00 to $5.00 per acre; that, in 1937, the same class of land can be bought for the same price; that, if bare land is acceptable, it may be had at $1.50 to $2.00 per acre; that the cheapest land is that which can be acquired with a stand of trees already present; that no other class of owners can produce wood as cheaply as can the farmer; that, although the corporate timber owner cannot grow timber as cheaply as can the farm timber owner, the pulp and paper mills of the South are committed generally to the policy of timberland ownership on a scale sufficient to guarantee a considerable percentage of their wood requirements from their own lands; that forestry must come on the corporation-owned pulpwood lands of the South; and that Southern pulp and paper corporations, desiring to fortify themselves for long-time production, may well direct their efforts along two lines as to wood supply—first, ownership of timberlands extensive enough to supply by current growth at least half their estimated wood requirements, and second, wholehearted effort to encourage and promote the growing of pulpwood by private landowners within trucking distance of the plant and within easy railroad or water haul.

Forest Policy of Mills

The fourth paper of the symposium, a paper entitled, *Wood for the Southern Pulp Mills*, was presented by Karl A. Swenning, Forester, Mead Corporation.

After citing the highly competitive demand for wood supplies which has been created by the rapid expansion of the pulp and paper industry in the region, Mr. Swenning mentioned that present operating mills, mills under construction and mills definitely announced for construction own or control 3,300,000 acres of timberland with an aggregate stand of 14,000,000 cords of pine pulpwood timber representing an investment of $20,500,000. That the lands owned or controlled by the southern pulp mills will be scientifically handled and managed on a basis of sustained timber production, continued Mr. Swenning, can be directly assumed but is best evidenced by the trained personnel being retained to put into effect operating plans.

Mr. Swenning added that individual managements must determine whether their properties will be operated with pulpwood as the sole crop or whether they will be handled as multiple use forests producing naval stores, saw logs, poles, piling, etc.; that, regardless of the end product of the southern pine forest, the management plan must have as its keynote a sound and workable system for fire detection and suppression; and that the industry has recognized that pulpwood cuttings on outside ownerships must be conducted on such a basis that these lands too will be kept in continuous timber production as a protection of plant investments.

Reference next was made to a conference held in May of this year at New Orleans to which representatives of federal and state forestry agencies, of the Southern Pine Association, and of the pulp and paper companies were invited. The object of the conference as pointed out by Mr. Swenning was to discuss details and formulate a program of forest utilization and conservation which will assure a continuing supply of raw material and to which all can subscribe. Mention likewise was made to regional meet-

ings which were held following the New Orleans meeting at Mobile, Ala., Savannah, Ga., Richmond, Va., and Alexandria, La., to work out and set up rules of forest practice applicable to the timber and operating conditions of the four sections.

It is now the plan of the pulpwood industry, iterated Mr. Swenning, to hold a meeting of regional committee chairmen to co-ordinate regional rules and attempt to iron out differences between regional standards of woods practice.

In concluding his remarks, Mr. Swenning stated that several pulp and paper companies have made public announcement of their forest policies to the end that all may know of the basis on which they hope to make their plants integral and permanent parts of the economic life of their individual locations; that other companies have made or are in the process of making unit or regional studies of available timber stands, the growth, current drain and other factors in order that wood procurement policies may be so formulated that future wood resources may be more, rather than less advantageously located; that the paper industry recognizes its responsibilities both in the economic and social life of the region; and that, given an opportunity to become established, the industry, it is believed, will demonstrate its sincerity of purpose and its ability to create a permanent industry, based on continued and continuing supplies of pulpwood.

No Wood Monopoly in North America

The fifth and last paper of the symposium on southern wood supply, a paper entitled, *Wood Pulp Supply of the World*, was the subject of John Traquair, Director, Research Department, Mead Corporation, and General Chairman of the Raw Materials Division of TAPPI.

At the outset, Mr. Traquair stressed the importance of wood as the basic raw material for paper and pulp; explained that North America has no monopoly on the stands of softwood nor of the total timber stands of all paper and pulp wood species; stated that the United States is the World's best customer for pulp and paper, consuming nearly one-half of all the pulp that is consigned to that market; called attention to the growing competition of the paper industry with the textile and other industries for cellulose raw materials—estimating that nearly one million tons of bleached sulphite will be diverted during 1937 to these uses, and cited the consistent drop of spruce on a percentage basis of the total wood used from about 75 per cent in 1900 to 50 per cent in 1925 and about 31.2 per cent in 1935 with the incident use of other woods.

Reference also was made by Mr. Traquair to the immense amount of work that has been done, since wood pulp first became a papermaking material, in improving the processes and product; to the development work during the years of 1920 to 1930 on straw, cornstalks, bagasse. Cuban cane and other industrial and agricultural wastes, projects for the most part which were proven to be economically unsound by the seven lean years of the depression; to the increased use of chemical pulp in papermaking as compared with mechanical wood pulp to meet the requirements of better paper and stronger wrapping paper; and to the necessity of possible rivals of wood pulp being competitive in price and equal in quality. In this latter connection, Mr. Traquair cited esparto as a well established alternative; said that bamboo is now established in India where most of the technical difficulties have been overcome; and related that straw, despite technical difficulties, is being used successfully in Europe in the production of high grade bristols and papers where good color and snap are desirable but is still mainly used for corrugating board in the United States—557,500 tons being produced in 1936.

Mr. Traquair likewise called attention to the pulp and paper producing countries of the world endeavoring to produce to the maximum point that their resources will allow but with some countries (those in which a nationalistic self-sufficiency program is in operation) attempting to utilize all kinds of industrial wastes and restricting size and quality of newspapers and other printed matter while allowing only a minimum importation of cellulose; said that actually 2000 or more species of plants are known to be possible sources of fibrous raw materials; and intimated that the next decade may demand a move to the Tropics where the annual production of cellulose is higher but, in most cases, more costly to make available.

After quoting some figures for world production, estimated consumption, imports and exports for 1936 from the "World Wood Pulp Statistics 1926-1936," second edition, published by the United States Pulp Producers Association, Mr. Traquair made brief reference to the outstanding features of the industry in a number of different countries.

World Status of Industry

The countries touched upon and the highlights of his remarks about each of them were as follows:

China—Mother Country of papermaking; pulp importation in 1936 about 15,000 tons; five paper mills in Shanghai district; a new Government mill ready for operation in Southern China with daily capacity of 50 tons of newsprint (pine wood from Western Kwantung Province to be used); manufacture of handmade native paper still important industry in certain districts; also paper mills in Indo-China; pulp and paper mill in Java using rice straw as raw material.

Japan—Papermaking industry almost entirely modern; domestic production increased from 551,000 tons in 1932 to 761,000 tons in 1936; first place in rayon and staple fibre production in 1936; United States main source of supply—shipped 156,000 tons of chemical pulp to Japan in 1936; control mills in Chosen and Manchukuo; projects covering new mills for Northern Manchuria for production of cellulose from rice husks, soya bean husks, reeds and pulp mill in British Columbia under consideration; present conditions point to rapid expansion of cellulose consuming industries.

British India—Produces no wood pulp; imports under 20,000 tons of chemical pulp; well-established local paper industry; paper made mainly from bamboo and Sabai grass.

Australia—No wood pulp manufactured at present; mill projected at Derwent Valley, Tasmania, to produce about 30,000 tons per year, mainly newsprint, from local woods; mill under construction at Burnie, Tasmania, to use local wood; about 40,000 tons of chemical pulp imported annually; project to make pulp from Kurukuru grass reported from time to time.

New Zealand—Three paper mills operating six fourdriniers and two Yankees.

Argentina—Fairly well-established paper industry; no wood pulp manufactured; over 30,000 tons of pulp imported annually, mainly from Sweden and Germany; one mill using Pomilio process making about ten tons of bleached straw pulp daily; expansion plans announced by Cellulosa Argentina to make Republic almost independent of foreign supplies.

Chile—Imports about 12,000 tons, mainly sulphite; one small straw mill (Pomilio process); several plants using local cellulose supplies.

Brazil — Well-established paper industry; no chemical wood pulp produced but mill projected and possibly under construction; pulp importation, mainly from European countries, about 90,000 tons, half of which was unbleached sulphite.

Trinidad — Small bamboo pulp mill established recently.

South Africa—One paper mill; projected mill to use native woods rumored.

Spain—Numerous small mills with only a few of them in any way modern.

France—Produces about 225,000 tons of pulp; imports about one-half million tons of wood pulp, one-fifth of which is mechanical; esparto pulp industry considerable; good deal of straw pulp for home consumption; most paper mills small but many surprisingly efficient.

Italy — Small mills; continual effort made to develop production of cellulose from native raw materials; cultivation and hybridization of Italian poplar extended by Government organizations; annual cellulose requirements about 300,000 tons; home output estimated at 25 per cent requirements—75 per cent imported mainly from Russia, Austria and Czechoslovakia; new mill at Foggia using chlorination process taken over by the State—production to be doubled to 60,000 tons; some old mills being modernized; five-year plan of tax free importation of machinery not available at present and needed for plant improvement in force; newspapers restricted to six pages only and rigid economy enforced in use of paper for printing purposes.

Germany — Produces 2,500,000 tons of pulp—imports about 173,000 tons, exports 257,000 tons; about two-thirds spruce wood required imported mainly from Russia (42 per cent). Czechoslovakia and Finland; peeled and unpeeled logs, not over 8 ft. long or 12 in. in diameter, removed in June, 1937, from list of articles requiring import permit; certain schooling in factory itself required of all persons entering paper trade as workers (management responsible for instruction); regulations regarding furnish in force for certain grades; use of waste paper encouraged.

Russia—Small paper industry before the Revolution—entire paper output prior to the War under 200,000 tons, 1936 production 763,700 tons, estimated 1937 production at least 1,000,000 tons; remaining forests required to build up pre-planned self-contained industrialized U. S. S. R. and improve the standard of living of the people.

Holland and Belgium — About 312,000 tons of pulp, mainly from Norway, Sweden, and Finland, used by these countries; Dutch strawboard well known, especially in British market; Dutch bristols have International reputation; papermaking in both countries highly developed.

Great Britain—Makes only about 16,000 tons of chemical wood pulp and imports practically all the papermaking raw materials; imported 1,165,000 tons of chemical wood pulp (mainly from Finland, Sweden and Norway) and 680,000 tons of groundwood pulp in 1936; some of the best handmade paper mills in the World on the Medway at Maidstone; esparto mills, located largely in Scotland, imported 322,000 tons of esparto grass in 1936 mainly from Algeria and Tunis; substitutes for esparto, such as Danube reeds, used to some extent; use of fibre containers growing rapidly; importation of paper and board amounted to 1,168,000 tons in 1936 and the total importation of papermaking materials to 2,735,000 tons.

Baltic Countries—Norway, Sweden and Finland—Acutely forest minded during last thirty-five years—only in Finland has there been any real expansion of production planned; United States pulp imports in 1936 from these countries totaled 1,450,074 tons—bleached sulphite 168,390 tons, unbleached sulphite 608,468 tons, sulphate 568,651 tons, bleached sulphate 47,131 tons, mechanical wood pulp 57,43. tons.

The other countries of Europe, such as Poland, Switzerland, Austria, Hungary. Yugoslavia and the Baltic States, said Mr. Traquair, have only a minor export trade which goes mainly to neighboring states. Only Czechoslovakia, he continued, has a considerable production and exported 120,000 tons of chemical pulp in 1936, of which 30,000 tons were consigned to the United States.

Wood Pulp Production Trends

Mr. Traquair, after calling attention to several graphs and tables relating to world wood pulp production (all grades), sulphite production of leading countries, sulphate production of leading countries, and World pulp productive capacity (January 1, 1936) and the capacity expansion scheduled for completion during 1936, 1937 and 1938, all reproduced with the permission of the United States Pulp Producers Association, related that 1937 will have 500,000 tons additional sulphite capacity and 1,250,000 tons of sulphate; that, for 1938, only 180,000 tons of sulphite capacity will come into use, but another 500,000 tons of sulphate; that the production of all grades of container and boxboards has grown from 3,500,000 tons in 1927 to 5,250,000 tons in 1936; that building and insulating boards have graduated in many cases from using waste wood to pulpwood as the raw material; that the future undoubtedly will see a larger use of paper and boards in conjunction with artificial resins and plastics; that, in 1936, the World produced a billion pounds of rayon yarn and about 300 million pounds of staple fibre—Japan being in first place, closely followed by the United States, then Italy, Germany, Great Britain and France; that it requires about 1.2 tons of sulphite pulp to make a ton of rayon yarn; that the use of staple fibre is rapidly expanding, especially in countries which have to buy most of their cotton and wool; that the production of cellophane and similar transparent wrappings has reached large figures; that cellulose acetate has consistently been making deep inroads into the uses and applications of cellulose nitrate; that it is impossible to predict the course of this competition of newer cellulose products for the raw materials on which the paper industry considered it had a monopoly; that new raw materials are being suggested continually and tried, but they do not displace or compete directly with those already in use; that no new raw material of any real importance has appeared since esparto and chemical wood pulp first came into use between 1860-1880; and that economic production in countries like India, Burma, Java, West Indies, Brazil, and some countries of Central America as well as others of South America is now quite feasible on a technically satisfactory scale with local raw materials, the use of bamboo, for example, having grown to respectable proportions in India.

Some Pertinent Predictions

For this country, Mr. Traquair predicted, in concluding his paper, new sources of raw material supply becoming commercially accessible; new raw materials coming into use; new processes being developed to use existing raw materials not easily utilizable by present processes; more extensive use of waste paper; greater use of agricultural wastes for special grades; increased efficiency and economy in pulp and paper making operations; and better forest management.

Plea to Keep Forests Productive

At the luncheon which followed shortly after the completion of Mr. Traquair's remarks, Colonel T. Guy Woolford, President of the Georgia Forestry Association, in speaking on *Forestry Problems in the South*, related that approximately one-third of the naval stores of the entire world are produced in Georgia alone. He stressed the need for weighing facts of existing conditions from time to time in order not to be misled over a long period of time by information that might be wrong. He cited the Capper report of 1920 and the Copeland report as examples of reports presenting incorrect facts relative to the forest situation. He likewise stated that, contrary to usual belief, lumber produced from a pine tree which has bled is slightly better than similar lumber produced from an unbled tree and that a vigorous growing second growth tree is best for turpentine production.

After referring to the progress made in protecting forests against fire, Colonel Woolford credited James Fowler of Soperton with the first commercial planting of pine trees in Georgia. He said that since 1926, when this first planting was made, that Mr. Fowler had planted more than one million trees on his own land. The year of 1931 also was pointed out by Colonel Woolford as being a momentous one in the history of the forestry movement in Georgia, as it was that year when the state forestry department was left as a separate department rather than being placed under the department of fish and game.

Colonel Woolford likewise related that it is necessary in the forests of the South to produce pulpwood, poles, cross ties, lumber and naval stores and pleaded, in conclusion, for sympathetic understanding and help in keeping these forests productive.

Timber Tract Visited

Following the luncheon, the afternoon was given over to a woods trip to Palmetto Bluff and to a golf tournament at the Savannah Golf Club.

Palmetto Bluff, acquired by the Union Bag and Paper Corporation of Savannah in the spring of 1937, is a tract of approximately 18,000 acres lying between the May and New Rivers in the southeastern corner of South Carolina. It has been the site of several plantations but with the passing of plantation days the once cultivated fields have grown up with loblolly and slash pine. There also are pulping hardwoods, black and red gums, in the swamp areas. Likewise, a three-year-old slash pine plantation covers one of the old fields.

The tract, for several years previous to its acquisition by the Union Bag organization, had been a hunting preserve. Turpentine operations also were and are carried on upon it.

While at Palmetto Bluff, a portion of the delegates inspected the timber tract, while others enjoyed a picturesque steamboat ride, embarking from a landing on the May River and disembarking at the same place, before returning to Savannah for the program of the evening.

TAPPI Welcomed to Savannah

The highlight of this evening program was the banquet with Judge Gordon Saussy as toastmaster and with addresses of welcome by Mayor Robert M. Hitch for the City of Savannah, by James H. Allen for the Union Bag and Paper Corporation, and by Dr. Charles H. Herty for the Pulp and Paper Laboratory and with the response for TAPPI by Grellet N. Collins, President of the Association.

Mayor Hitch presented a rather extensive soliloquy of a southern pine in which Dr. Herty was eulogized and then most fittingly and in a few brief remarks welcomed the gathering to Savannah and expressed the hope that the meeting would be productive of great good to the industry and to the entire section of the country over which the industry is destined to extend.

Mr. Allen, speaking in place of Alexander Calder, President of the Union Bag and Paper Corporation, and who had been called unexpectedly to New York, said that it was an inspiration to have such a great reservoir of wisdom assemble in Savannah. He likewise congratulated the scientific men of the Convention for their accomplishments and graciously acknowledged in behalf of his company the formulas which they have developed. The difficulty of financing some of these new developments likewise was cited and mention made that kraft is $30 a ton cheaper today than some years ago as a result of them.

Dr. Herty, after referring to the size of the Convention, expressed the hope that many of the delegates, who perhaps had come into the South as doubting Thomases, would catch the vision. He also said that the South was destined to take on new life with the coming of the mills through the paying of higher wages and the development of higher living standards.

Other Banquet Highlights

On behalf of TAPPI, Mr. Collins responded to the welcoming remarks of Mayor Hitch, Mr. Allen and Dr. Herty and thanked every one who had taken part in the making of the Convention in the South and particularly D. G. Moon as Chairman of the General Committee and Dr. Charles Carpenter as Vice-Chairman.

Mr. Collins also called attention to the newsprint expansion of some years ago in Canada and to the present kraft expansion in the South. He queried as to whether the expansion might be overdone and stated that what the industry needs is permanent stability.

Mr. Collins likewise referred to the tremendous increase in the use of chemical pulps by the rayon industry; intimated that by the development of new uses, the market for paper and board is almost unlimited; stated that the tendency is toward lower costs; and asserted that the mills will have to be kept up to date with both machinery and men.

Entertainment during the banquet included two vocal numbers by Hugh Taylor, tenor; the singing of negro spirituals by the St. John Baptist colored choir and by a quartet from Georgia State College; and by a mock long-distance conversation between Mr. Spruce and Col. Southern Pine which revealed some real as well as imaginary difficulties of the paper business.

The DeSoto Hotel in Savannah, Georgia, official and social center of activities during the meetings of the Technical Association

Symposium on Pulp Mill Practice

O. W. A. Rodowski, Chief Chemist of the Savannah mill of the Union Bag and Paper Corporation, presided as Chairman of the technical session on the morning of the second day of the Convention. The session was devoted to a symposium on pulp mill practice.

New Process for Kraft Pulp Bleaching

Of the several papers scheduled for presentation before this session, the first a joint paper by Dr. J. Campbell and L. O. Rolleston, both of the Research Division of the International Paper Company, was entitled, *High Density Vacuum Bleaching of Kraft Pulp.*

The paper stated in part that the bleaching of brown kraft pulp was carried out originally in about the same manner as the bleaching of sulphite pulp by using hypochlorite of lime; that the strength qualities and color of kraft pulp bleached in this manner were inferior to bleached sulphite pulp; that about seven or eight years ago it was found that if a brown kraft pulp was given a chlorine treatment and then a subsequent hypochlorite of lime treatment with a water wash and alkali cook between the two treatments that a pulp of very much improved strength and color qualities could be obtained; and that a new method of bleaching, designated as High Density Vacuum Bleaching, was invented to overcome the disadvantages of the latter process as it is usually carried out.

In the new process, pulp at a consistency of 35 to 50 per cent is subjected to a vacuum of about 28 inches of mercury in a suitable vessel and then chlorinated. Chlorination is usually followed with an air wash before the vessel containing the chlorinated pulp is opened. In the subsequent stage of bleaching, the chlorinated pulp may be washed with water, then heated at atmospheric pressure with a caustic soda solution and then given a further double treatment with hypochlorite of lime with a water wash between each treatment.

The paper also described a process which was stated to be particularly ideal for making a semi-bleached kraft. In this process, which also is patented, the slush pulp is treated with an alkali or an alkaline earth pulp and then concentrated to a consistency of 40 to 50 per cent. After concentration, it is bleached white by chlorination in High Density Bleaching equipment—the change from brown kraft pulp to white kraft pulp being said to take place in only a portion of a minute or in about the time required for the chlorine gas to penetrate the vacuum between the fibers.

Vertical Furnace for Lime Reburning

Reburning Lime by the Herreshoff Furnace, the title of the second paper of the symposium on pulp mill practice schedu'ed for presentation, was the subject of K. A. Forrest, General Manager, Crossett Paper Mills.

Mr. Forrest in this paper stated that the furnace is vertical, brick lined iron or steel cylinder having variously from six to twelve superimposed hearths, and a central rotating shaft which carries radial stirring arms with blade (or teeth) set at proper angle for stirring and moving material; that the shaft and arms are air cooled; that, when starting a cold furnace, precaution must be taken to observe

that everything is in proper adjustment before placing the motor in operation that drives the furnace and subsequently lighting the gas burners on the bottom hearth by using a kerosene or fuel oil torch; that the temperature rise on each hearth should not rise more than 20 deg. Fahr. per hour for the first 24 hours; that additional burners can be lighted after the first 24 hours and the temperature raised at a rate of 30 deg. Fahr. per hour for 24 hours; that, after 48 hours, the temperature can be raised as fast as desirable without damage to the furnace; that the air cooling fan for central shaft and arms should be started after first 24 hours and shaft temperature kept below 480 deg. Fahr.; that same procedure is advisable in shutting down as in starting up but reversing the operation; that feed may be started when furnace is raised to temperatures on each hearth that it is intended to maintain during operation; that the drying hearth in the burning of lime acts as a conditioner of the material; that a too dry condition on the drying hearth has a tendency of making the material "mealy" throughout its travel; that the behavior of the material after getting inside the furnace is entirely a matter of temperature control under constant feed conditions with a nominal consideration of chemical composition; and that through actual operation it has been found that the following temperatures on their respective hearths will give a product of high quality with no "burning" and no cores—No. 8 hearth, 1200 deg. Fahr. plus; No. 7 hearth, about 1300 deg. Fahr.; No. 6 hearth, 1400 deg. Fahr. plus; No. 5 hearth, 1500 deg. Fahr. plus; No. 4 and No. 3 hearths, between 1600 deg. Fahr., and 1700 deg. Fahr.; No. 2 hearth, 1700 deg. Fahr. to 1750 deg. Fahr.; and No. 1 hearth, 1800 deg. Fahr. plus.

Chemical Balance of Causticizing System

The third paper on the program of the symposium on pulp mill practice, a paper entitled *Chemical Balance for a Continuous Recausticizing System* and jointly contributed by O. W. A. Rodowski, Chief Chemist of the Savannah mill of the Union Bag and Paper Corporation, and C. L. Knowles, Manager, Chemical Division, The Dorr Company, Inc., was presented by Mr. Knowles.

Mr. Knowles stated that a careful study had been made of the soda balance in the No. 2 Dorr causticizing unit at the Union Bag and Paper Corporation's plant at Savannah, Ga., and that the study revealed an overall soda recovery of 98.84 per cent. Information gathered as a result of the study was arranged and presented in the form of several tabulations. One gave detailed data which was the basis of the soda balance, another gave the temperatures maintained at various points throughout the operation, while a third presented a soda balance summary. This latter table is reproduced herewith.

CHEMICAL BALANCE IN A DORR CAUSTICIZING SYSTEM IN TERMS OF SODIUM SULPHATE PER TON OF PULP

A)	Soda Entering as Sodium Sulphate	
	Raw green liquor	2281.93 lbs.
B)	Soda Recovered as Sodium Sulphate	
	As strong white liquor	1687.5 lbs.
	As weak green liquor	29.30 lbs.
	As weak white liquor (and this includes soda from filtrate)	538.789 lbs.
C)	Soda Lost as Sodium Sulphate	
	In classifier grits	0.023 lbs.
	In green dregs to sewer	2.63 lbs.
	In filter cake to kiln	23.71 lbs.
	Summary	
(1)	Total soda entering	2281.93 lbs.
(2)	Total soda recovered	2255.566 lbs.
(3)	Total soda lost	26.364 lbs.
	(A) Overall soda recovery in green liquor system	99.88%
	(B) Overall soda recovery in white liquor system	98.95%
	(C) Overall soda recovery in Dorr system	98.84%

Sulphate Pulp Washing Methods Discussed

The symposium on pulp mill practice likewise included a paper on *Vacuum Washers vs. Diffusers*, by H. A. Morrison of Oliver United Filters, Inc. This paper, read by F. W. Young, also of Oliver United Filters, Inc., stated in part that two types of washing equipment are used in kraft pulp manufacture for the removal of black liquor, namely: continuous vacuum filters arranged for multi-stage washing by countercurrent methods, and closed diffusers which are usually arranged in series; that the application of refiners for mechanical treatment of pulp before washing in diffusers presents some serious difficulties; that under ideal conditions, diffusers produce excellent results, but they "work in the dark" and when average performance has been accurately determined, the net result is often disappointing; that the tendency of fiber to float in a diffuser is due to air bubbles adhering to individual fibers and can be corrected by putting the diffuser under moderate pressure; that, in general, diffuser results are unaffected by stock hardness or original moisture content of the wood; that diffuser wash water or liquor should be very hot—around 190 deg. Fahr. when practicable; that multiple stage vacuum filters, so designed that air is not intimately mixed with black liquor, are established as commercially superior to diffusers for washing Southern kraft pulp; that repulping of the stock between washers is handled in a manner that avoids foaming; that a single line of three washers in series will handle 300 tons per 24 hours; that various sizes of washers for capacities from 100 to 350 tons per line are available; that, with all operations controlled from a central switchboard, a single operator can comfortably operate such a system; that all varieties of alkaline pulps are now being washed on vacuum washers for removal and recovery of black liquor; that vacuum filter wash systems are in daily operation in Canada, in the Southern States, on the Pacific Coast, and in Sweden; that two large kraft liner pulp mills, using three stage washing systems, are now being built in the South; that it is entirely safe to predict that these vacuum filter washing systems will send black liquor to the evaporators at above 14 deg. Bé. (corrected to 60 deg. Fahr.) and that they will show a total washing loss below sixty pounds of salt cake per air-dry ton of pulp; and that in a 600 ton mill, the daily net credit for filters over diffusers amounts to $390.00.

Other Papers of Symposium

Six other papers were listed on the program of the symposium on pulp mill practice for presentation by title. One of these papers, a paper entitled *Pulp Bleaching Under Ultra-Violet Light*, was the contribution of W. Hirschkind in collaboration with D. J. Pye and E. G. Thompson, each of the Great Western Electro-Chemical Company.

Another paper, one entitled, *Southern Clays for Paper Making*, was the subject of Poole Maynard, Industrial Geologist.

The remaining four papers were contributions of the staff of the U. S. Forest Products Laboratory and were as follows: *Effect of the Viscosity of the Grinding Medium in the Mechanical Pulping Process*, by E. R. Schafer and J. C. Pew; *Sulphate Pulping of Longleaf Pine—Effect of Chemical—Wood Ratio on Yield and Quality of Pulp* by M. W. Bray, J. S. Martin and S. L. Schwartz; *Grinding of Loblolly Pine—Relation of Wood Properties and Grinding Conditions to Pulp and Paper Quality* by E. R. Schafer, J. C. Pew and C. E. Curran; and *Sulphate Pulping of Southern Yellow Pines—Effect of Growth Conditions on Yield and Quality* by M. W. Bray and C. E. Curran.

Use of Ultra-violet Light in Pulp Bleaching

The paper, "Pulp Bleaching Under Ultra-Violet Light," reviewed the work of Rene Escourrou (Chimie et Industrie, June 1928) and reported on tests made by the authors to determine the optimum condition of using such light. The authors pointed out that light rays shorter than 300 millimicrons evidently have a detrimental effect on cellulose; that beyond 400 millimicrons the visible light present is not of any appreciable value; and that the range between 350 and 385 may be considered optimum.

Sources and Characteristics of Southern Clays

Mr. Maynard in his paper, "Southern Clays for Paper Making," mentioned that

practically all of the filler and coating clays produced in the South come from Georgia and South Carolina; that Georgia produces more than 50 per cent of the clays used in the United States for paper making; that valuable deposits of white clays are found in Virginia, North Carolina, Alabama, Florida and Texas; that the filler and coating clays now being produced in the South are confined to the sedimentary kaolins of Georgia, South Carolina and Virginia; that the development of paper clays in the United States has progressed along the lines of least resistance; that the paper clay of tomorrow will be of good white color composed of clay particles of colloidal size; that such a clay can be obtained from deposits now being developed by the separation of the colloidal like clay from the coarser clays; and that the sedimentary clays of the South suitable for use in the manufacture of paper are in practically unlimited deposits and have a thickness of from ten to thirty feet or more, with an overburden seldom more than one foot for each ton of clay mined and often much less.

Viscosity Study in Production of Mechanical Pulp

Mr. Schafer and Mr. Pew, in their paper on "Effect of the Viscosity of the Grinding Medium in the Mechanical Pulping Process" reported that grinder runs at the Forest Products Laboratory have been made at various pit temperatures with water as the grinding medium and also at various pit temperatures in which the normal viscosity changes have been offset by the introduction of appropriate quantities of cane sugar; that, when a normal consistency of pulp is maintained constant, an increase in pit temperature results in longer-fibered, stronger pulps at decreased energy consumption; and that these effects tend to diminish when a fixed viscosity accompanies an elevation in temperature, indicating that viscosity changes, in part at least, are responsible.

Southern Pulp and Paper Development Reviewed

The luncheon speaker on the second day of the Convention was James H. Allen, Vice President, Union Bag & Paper Corporation. Mr. Allen, introduced by R. G. Macdonald, Secretary of TAPPI, spoke on the "History of Making Pulp and Paper in the South."

In his remarks, Mr. Allen mentioned that the first attempt to make paper from southern pine was made by Smith and Thomas about 1903 at Pensacola, Florida, that the first sulphate pulp to be produced from southern pine was made in 1911 at Orange, Texas, by E. H. Mayo; that the second mill to use southern pine for paper manufacture was built in 1913 at Moss Point, Miss.; that an English syndicate built a mill in 1898 at Braithwaite, Louisiana, to make paper from bagasse; that this mill was taken over in 1915 by E-Z Opener Bag Company, now the Gulf States Corporation, and operated until 1931, when most of the equipment was transferred to its operations at Tuscaloosa, Alabama; that Joseph H. Wallace, Consulting Engineer, built a mill in 1906 at Roanoke Rapids for the Roanoke Rapids Paper Company; that the Brown Paper Mill Company of Monroe, Louisiana, is a large offspring of the mill at Orange, Texas; that the first unit of this mill was built in 1923; that the first fourdrinier board was made in 1923 by Hummel-Ross Fibre Corporation at Hopewell, Virginia; that, in 1917, the Bogalusa Paper Company built a sulphate pulp and container board mill; that R. J. Cullen, now President of the International Paper Company, started his southern experience in about April, 1918, at Bogalusa with the old Louisiana Fibre Board Company; that, in the early part of 1917, the Chesapeake Corporation at West Point, Virginia, installed a jute manufacturing mill; that R. J. Cullen, backed by L. H. Fox of Kansas City, built a sulphate pulp mill about 1920 at Bastrop, Louisiana, to which a paper mill was soon added; that, with the backing of John I. Beggs, he promoted and built the Louisiana Pulp and Paper Company; that both of these mills later were sold to the International Paper Company; that that company formed the Southern International Paper Company and made Mr. Cullen president; that the mill at Camden, Arkansas, was finished in 1928; that the mill at Mobile, Alabama, was completed in 1929; that the Southern International Paper Company was dissolved at that time and the Southern Kraft Corporation formed; that the Southern Kraft Corporation completed the mill at Panama City, Florida, in 1931 and the mill at Georgetown, South Carolina, in the summer of 1937; that the first machine in the mill of Southern Advance Bag & Paper Company was installed in 1928, the second in December of 1931; that the Champion Fibre Company at Canton, North Carolina, have played a most important part in the development of the pulp and paper industry in the South; that, within the current year, the Champion Fibre Company completed a bleached sulphate plant at Houston, Texas; that the West Virginia Pulp and Paper Company finished a 300-ton board mill in 1937 at Charleston, South Carolina; that the Union Bag & Paper Corporation, in the summer of 1936, finished its first pulp and paper mill development in the South; that the cost of making kraft paper in the South in the past ten years has been reduced at least $33.00 per ton; that the Federal Government through the R. F. C. in 1936 financed the building of a mill for the Crossett Lumber Company in Arkansas; that the jute industry has become interested in the South—the Kieckhefer Container Company with the Robert Gair Company having a mill under way at Plymouth, North Carolina, and the Container Corporation of America at Fernandina, Florida; that the Mead Corporation and Scott Tissue this year commenced the construction of a bleached sulphate pulp mill at Brunswick, Georgia; that the Mead Corporation with Edward Ball of Jacksonville are building a 300-ton board mill at St. Joe, Florida; that the Camp Manufacturing Company with Messrs. Ellerson and Olsson are constructing a 150-ton board mill at Franklin, Virginia; and that Messrs. Mayo, Westervelt, Brown, Hardy, Wallace, Goodyear, Hummel, Cullen, Ellerson, Kelly and others have been the rugged individuals who in twenty-five years have built plants in the South which in 1938 will have a combined capacity of one million seven hundred thousand tons of sulphate pulp—a capacity that will supply 20 per cent of the consumer demand of the nation.

Plant and Laboratory Inspection Tour

The rest of the afternoon, following the luncheon, was given over to an inspection tour of the Union Bag & Paper Corporation plant and of the Pulp and Paper Laboratory.

Members of the Union Bag & Paper Corporation's police force guided the delegates through the various departments of the mill. The tour of the mill began in the wood yard and followed for the most part the flow of materials in the processing operations, terminating with an inspection of the bag plant. Three of the most imposing sights in the trip through the mill in the order of viewing them included the installation of rotary lime kilns, the installation of jordans, and the installation of paper machines. Each of these installations left a definite impression of the enormous size of the mill operations and no one could view them without marveling somewhat about the rapid strides which have been made during very recent years by the pulp and paper industry.

Dr. Herty personally greeted all delegates who visited the Pulp and Paper Laboratory. Visitors to the Laboratory also were presented with sample pages of the *Savannah Evening Press* which were printed upon newsprint paper made from a furnish containing 75 per cent of black gum groundwood. The remainder of the fiber furnish was semi-bleached sulphate.

Colorful Costume Party

A Crinoline Days' Dinner Party featured the evening program of the second day of the convention. It was a costume party that hearkened back to ante bellum days. Ladies wore dresses of the period while men dressed in Simon Legree suits and Confederate uniforms. A typical French-Canadian lumberjack's attire also was in evidence, and all of the men wore paper hats, either of the stove pipe variety or of the Simon Legree type.

Among those who won prizes for beauty and originality of costumes were: Mrs. Edward H. Mayo, Dr. John V. N. Dorr, Mrs. E. A. Ellis, G. T. Wegner, Mrs. D. G. Moon, Kurt Wandell and Miss McLamb.

A yellow crepe dress of paper was worn by Mrs. Kenneth Bishop.

Favors at the party were very unique. They included menus printed on Asten-Hill asbestos dryer felt, plantation dolls with *Tappi* embroidered on the apron of each of them, and miniature bales of cotton upon each of which sat a little pickaninny eating a slice of watermelon.

During the banquet, the delegates and guests were delightfully entertained by local colored artists, who, through dance, music and song, typified the life of the old

and the new South. Their selections were rendered most effective because of the setting in which they were done. It was that of a typical negro cabin, the cabin having been torn down, each part marked, transported to the De Soto Hotel and reassembled in the main dining room for the occasion.

"Uncle Amos," reputedly an original Hermitage plantation slave, sat on the porch of the cabin throughout the entire program of entertainment and apparently viewed it with the same keen enjoyment as did all those attending the banquet.

Golf prizes, presented at the banquet, went to C. F. Bingham, Barberton, Ohio; H. C. Zeni, New York; A. B. Hansen, Green Bay, Wisconsin; J. Donaldson, New York; C. H. Champion, New York; J. H. Brougham, York, Pennsylvania; J. A. Turner, Chicago; A. G. Stone, York Haven, Pennsylvania; Mrs. H. M. Rice, Watertown, New York; and Mrs. F. M. Filluis, Rochester, New York.

Numerous other prizes also were distributed during the banquet program. The prize winners in this case were selected by the drawing of lucky numbers, "Uncle Amos" doing the drawing.

A sea battle between U. S. S. "Tappi" vs. Fort Depression took place in the pool of the De Soto Hotel immediately following the dinner, and, although it probably had been planned otherwise, U. S. S. "Tappi" sank, after putting up a good battle with fireworks, to the surprise and perhaps pleasure of most of the spectators. Of course, it was all in fun and was all the more colorful because of it.

Technical Session of Third Day

Seven papers were scheduled for presentation before the technical session on the morning of the third and last day of the Convention and over which Dr. Charles Carpenter of the Pulp and Paper Laboratory of Savannah presided as chairman.

Holocellulose Determination in Wood

The first of these papers, a joint paper by Wm. G. Van Beckum and Geo. J. Ritter, both of the Forest Products Laboratory, and entitled *Rapid Methods for the Determination of Holocellulose and Cross and Bevan Cellulose in Wood*, was presented by Dr. Ritter.

Dr. Ritter mentioned that holocellulose is the carbohydrate fraction in extractive-free wood; cited the previous work on holocellulose by Schmidt, Tang and Wang, Ritter and Kurth, and Bird and Ritter; stated that the determination of holocellulose in wood consists in the removal of lignin and the retention of the holocellulose; said that previous work on the determination had shown that lignin can be removed as lignin chloride; related that a solution of 95.0 per cent ethyl alcohol containing 3.0 per cent monoethanolamine was selected as a most promising lignin-chloride solvent; and set up procedures for the determination of holocellulose and for the determination of a fraction comparable to Cross and Bevan cellulose by the utilization of holocellulose. He further stated that by employing the methods which had been suggested that the holocellulose, a fraction comparable to Cross and Bevan cellulose, and the lignin content of extractive-free wood can be determined on a single wood sample.

Fiber Structure Investigations Outlined

The second paper on the program of the session, a paper entitled *A Further Report of the Changes Taking Place in the Structure of Fibers as a Result of the Operations of Pulping and Stock Preparation*, was the subject of Dr. Harry F. Lewis of The Institute of Paper Chemistry. Dr. Lewis first stated that one section of the program on fundamental research at The Institute of Paper Chemistry deals with the structure of paper making fibers and the changes occurring as a result of pulp and paper operations; mentioned briefly the work which already has been reported; and covered in some detail three additional studies in this same general field.

The first involved an investigation of the physical and chemical effect of extraction of pulp fibers with pectic solvents which resulted in the conclusion that pectic solvents, with the exception of acids, have little effect on the viscosity characteristics of wood pulps and that wood pulps can be dispersed in cupramonium hydroxide of the strength and under the conditions specified by the Tappi Standard Method.

The second study, mentioned by Dr. Lewis, dealt with the characteristics of highly lignified pulps. It appears from this study, stated Dr. Lewis, that the development of strength in pulps is related to the removal of the middle lamellar lignin. He suggested that as the latter dissolves, a continually increasing area of cellulose is presented in the outer wall of the fiber and that this cellulose takes an active part in the beating operation.

The final study, reported by Dr. Lewis, dealt with an investigation of the cooking and bleaching behavior of 20 micron-thick cross sections of spruce, pine, and poplar wood during sulphite, soda, and kraft cooks, and hypochlorite bleaches. Among the points mentioned in connection with this study was the difference in mechanism of sulphite cooking, on the one hand, and the alkaline cooking, on the other, the sulphite cook showing simultaneous removal of secondary wall lignin along with the middle lamellar lignin, while the alkaline pulps appeared to dissolve preferentially the middle lamellar lignin, leaving the secondary wall lignin within the fiber until a large share of the middle lamellar lignin has been removed. This fact, said Dr. Lewis, may account for the difference in behavior of acid and alkaline cook fibers and may also account for the difficulties involved in the bleaching of alkaline pulps.

Natural Fibers Described

The Visible Structures of Natural Fibers was the title of the next paper on the program. It was the subject of Thomas Kerr, Associate Cytologist, Bureau of Plant Industry, U. S. Department of Agriculture. In this paper, Dr. Kerr limited his discussion chiefly, to the growth and structure of two types of fibers—(1) cotton hairs and (2) coniferous tracheids (i.e. pine wood fibers). Dr. Kerr pointed out that the cell wall of these fibers is composed of two parts, a thin primary wall which encloses the protoplasm during the period of cell enlargement, and a secondary wall, which consists of wall thickening laid down after enlargement has ceased; that cotton hairs are outgrowths of the epidermal cells of the seed coat, whereas wood fibers are derivatives of the cambium; that the growth of these fibrous elements differ because of their different botanical source, but the finer structure of their cellulose framework is essentially similar; and that both are built up of a firm and coherent matrix of anisotropic cellulose, in the form of fine branching threads, the finer details of which grade down to the limits of microscopic visibility.

He likewise mentioned that, in the secondary wall of cotton fibers the delicate cellulose threads wind spirally around the inner surface of the primary wall; that the direction of the spiral reverses frequently along the length of the wall; that the lamellations (growth rings) in the swollen mature fibers are correlated with differences in the density of the cellulose; that these lamellae may be obliterated by controlling the environment during the growth of the fiber; and that in the secondary wall cellulose of wood fibers, lamellations are due to (1) changes in the orientation of the cellulose, (2) varying densities of cellulose threads, and (3) the presence of non-cellulose layers. Lignin, said Dr. Kerr, may be deposited as an encrusting substance in the interstices of the cellulose matrix.

Review Work on Fastness to Light Study

H. Ainsworth Harrison, Chief Chemist of Cook & Nuttall, Ltd., Horwich, Lancashire, England and Chairman of the Fastness to Light Committee of the Technical Section of the British Papermakers Association followed Dr. Kerr with a paper on *Fastness to Light of Coloured Papers*. This paper reviewed the work of his committee in attacking and solving the problem to which it had been assigned. Several avenues of approach to the problem were touched upon but concentration was placed on the development of a series of optical paper wedges which permitted comparisons to be made with known standards. Mr. Harrison exhibited samples of the work which has been done, mentioned that the rapidity of fading is a seasonal variation, and made passing reference to some of the more recent work of his committee suggesting that it is the desire of the committee to develop a simple method for fastness to light determinations, one that can be utilized by individuals without technical training.

In concluding his remarks, Mr. Harrison expressed the pleasure that was his as well as of four other members of the British Papermakers Association in being present at the Savannah meeting and extended an invitation to Tappi members

Air view of the Hercules Powder Company's naval stores plant at Brunswick, Georgia

to attend the next meeting of the Technical Section of the British Papermakers Association. He said that he hoped at least five members might attend.

Southern Pine Sulphite Pulp Characteristics

The last two papers of the session were contributions of the Pulp and Paper Laboratory of Savannah, the first by Dr. Charles, Carpenter, Chief Chemist, on *Acid Pulping of Southern Pine-Sulphite Pulps for News Print and Viscose*, and the second by A. C. Fuller, Plant Superintendent, on *Newsprint from Southern Pine-Groundwood from a Coarse Stone, Sulphite or Sulphate Chemical Pulp.*

It was brought out in the paper by Dr. Carpenter that longleaf pine (Pinus palustris), pulped by the sulphite process at yields of 40-50 per cent and 3-12 per cent chlorine consumption, was employed with pine groundwood in newsprint; that the chemical pulp constituted 20-25 per cent of the furnish; and that the newsprint ran and tested satisfactorily on the experimental fourdrinier machine.

Dr. Carpenter likewise mentioned that longleaf (*Pinus palustris*) and loblolly (*Pinus taeda*) pine, pulped by the sulphite process at yields of 41-42 per cent, were bleached and converted into viscose yarn of satisfactory quality; that the unbleached pulps consumed 1.5-2.5 per cent chlorine as hypochlorite, has alpha cellulose contents of 88-91 per cent and reduced cuprammonium viscosities (Tappi) of 50-100; that the ether soluble content was reduced to 0.5 per cent or less by washing with large volumes of water; that the bleached pulps had alpha cellulose contents of 88-91 per cent, copper numbers of 1.6-3.0, cuprammonium viscosities of 20-30 and brightness values of 80-87; that the hemicellulose from press and drain liquors amounted to 6.0-7.5 per cent; that the filtration of the viscose varied from poor to excellent, according to the purification of the pulp; that the dry yarn tested 1.4 to 1.6 g.p.d. at 13-16 per cent elongation; that the west tests were 0.5-0.7 g.p.d. at 18-26 elongation; and that these tests were within the range of those of commercial rayon pulps processed under the same conditions.

Groundwood and Newsprint from Southern Pine

Mr. Fuller, in his paper on "Newsprint from Southern Pine" stated in part that longleaf (*Pinus palustris*) and loblolly (*Pinus taeda*) pine and mixtures of the two were converted into groundwood on an artificial stone of very coarse grit (301-1-182); and that at 22 (points per pound x 100) Mullen the grinding data was as follows:

Longleaf—80 h.p.d. per ton, 11.5 tons per 24 hr. per 10 sq. ft., 150 cc. Schopper-Riegler, 0.52 g. per lb. tear.

Loblolly—80 h.p.d. per ton, 13.5 tons per 24 hr. per 10 sq. ft., 170 cc. Schopper-Riegler, 0.57 g. per lb. tear.

Mixed—82 h.p.d. per ton, 10 tons per 24 hr. per 10 sq. ft., 180 cc. Schopper-Riegler, 0.52 g. per lb. tear.

At this burst, Mr. Fuller said that the percentage of pulp passing 100 mesh was 50 for longleaf, 45 for loblolly, and 47 for mixed wood.

Among the other comments made by Mr. Fuller were that several batches of such longleaf and loblolly groundwood pulps were composited for use in newsprint runs; that the composite was two-thirds longleaf and one-third loblolly, at a weighted power rating of 89 h.p.d. per ton; that the composite was made up with both unbleached sulphite and semi-bleached sulphate (80-20) and made into newsprint on the laboratory fourdrinier machine; that the caliper of the sheets varied from 0.0032 to 0.0037, the basis weight (24x36-500) 32.3-34.5, Mullen (points per pound x 100) 24-30, tear (grams per pound x 100) 48-73; that the formation and finish of the sheets were good; that the paper printed satisfactorily on high speed rotary presses; that some black gum also was ground and mixed with 25 per cent semi-bleached pine sulphate and run over the paper machine; and that the paper printed satisfactorily on high speed rotary presses.

A short business session interposed between the remarks of Mr. Harrison and Dr. Carpenter completed the proceedings of the technical session on the morning of the third and last day of the convention.

Afternoon and Evening Activities of Third Day

The afternoon of the closing day of the Convention was one of relaxation. It was spent at the Pavilion at Tybee Beach on the Atlantic Ocean, where an oyster roast and Brunswick stew as well as other delectables fitting for such an outing were served. Then, too, there was a free-for-all

boxing match which was staged in a ring that had been set up on the beach. The participants were young colored fellows who through most unorthodox pugilistic antics amused delegates and guests for some little time.

The formal program of the meeting was completed with the serving of a buffet dinner at Hotel De Soto. This dinner, however, by no means ended the convention, as immediately following it, the P. M. C. Special, a train chartered by the Hercules Powder Company, Inc., and said to be the largest convention special ever made up in Savannah, proceeded to Brunswick, Ga., with about 50 per cent of the total number of registrants at the convention. These passengers, as guests of the Hercules Powder Company, were entertained en route, after which they slept aboard train, had breakfast on the train, and then in the morning visited the naval stores plant of the Hercules Powder Company in Brunswick.

From Pine Stumps to Naval Stores

The trip through the plant was made in small groups, each group being in charge of a courteous and well-informed guide who explained in some detail the nature of the operations involved in converting pine stump wood into naval stores.

The stump wood, delivered to the plant by railroad or truck, is washed with high pressure water sprays upon a chain conveyor as it is being conveyed to a large chipper. The chipper reduces this washed wood to chips, which, in turn, are further reduced by shredders or crushers. Following this reduction, the chips are conveyed to extractors.

The extractor installation, until recently, consisted of a battery of 30 units, each 22 ft. high and 10 ft. in diameter. Now 15 new extractors, each 27 ft. high and 8 ft. in diameter, are being installed to replace the 30 old ones.

Although the new extractors have about the same capacity as the old, 15 to 16 tons of chips to a charge, improved operating conditions will permit them to handle an increased tonnage per day. The old extractors operate under 50 pounds pressure; while the new ones are built to operate under a pressure of 100 pounds.

In the bottom of each extractor is a screen which serves as a filter. Under the screen is a steam coil arrangement for heating extraction solvent and a jet arrangement for the introduction of live steam to steam out volatile oils and to remove extraction solvent. Likewise, on the side of each extractor, near the bottom, is a large door through which the spent chips are removed to a conveyor which delivers them to storage in the power house for use later as fuel to provide power and steam for the entire plant.

The crude oils removed from the chips during extraction are delivered first to large tanks where wood dust and small chips are settled out and then the filters and afterward to refining equipment.

Steam-heated vacuum column stills with a daily capacity of about 3,000 gallons of finished product at a high reflux ratio are used to refine the liquid products. Altogether about 1,000,000 gallons of various liquids are fractionated per month to yield about 250,000 gallons of finished products—the average recovery in the stills being better than 99 per cent.

The clarified rosin solution is passed through a series of Yaryan horizontal tube evaporators. The first stage units, operating on low pressure steam and at 15 inches of vacuum, concentrate the solution from 15 to 20 per cent of resins and oils to about 80 per cent. At this concentration it is passed to a series of intermediate units where most of the oils and solvents are removed under high vacuum and finally to high-pressure, high-vacuum units where the oils are removed and dry rosin discharged in the molten state.

Solvent recovered from the low pressure evaporators is returned to extraction solvent storage; while the oils recovered from the intermediate and high pressure evaporators are fractionated for complete separation from traces of solvent and refined.

The molten rosin, pumped to tanks in the rosin barreling shed, is maintained at a temperature of about 325 deg. Fahr. to facilitate handling. This rosin, known as FF Wood Rosin, through further refining with selective solvents yields pale grades of wood rosin ranging from H to WG and a dark resin known as Belro Resin.

Actual weighing of the rosin to check yields is made possible through the use of specially designed weigh tanks.

When tank cars are loaded with rosin, samples are taken for analyses and record samples are kept. Likewise, samples are taken hourly for analysis when rosin is being barreled.

Both wooden barrels and light-weight steel or galvanized iron drums are used for shipping the rosin. A cooperage plant as part of the operations converts short sections of logs into staves and heads and assembles them into finished barrels. These barrels are weighed individually, and exactly 415 pounds of rosin is put in each of them. Each of the lightweight steel or galvanized iron drums, also assembled at the plant from sheet material, on the other hand, hold approximately 475 pounds of rosin.

All containers are marked with date of manufacture, shift number, weight and grade so that any specific lot can be traced easily.

Post Convention Luncheon

With the trip through the plant completed, the visitors, still as guests of Hercules Powder Company, enjoyed a short stay and luncheon at the Cloister Hotel at Sea Island, Georgia. Time was found by some of the guests for an afternoon of golf. Others went sightseeing. Still others visited the new mill of the Brunswick Pulp and Paper Company which is in process of construction and will be ready to be placed into operation shortly.

These post convention activities proved to be a fitting climax to a most successful fall meeting and they will remain long in the minds of those privileged to participate in them.

There are yet two activities of the convention, however, which cannot escape mention. One was the ladies' program and the other was the equipment exhibition.

Activities of the Ladies

The ladies' program started off on the morning of the first day of the meeting with a Crinoline Days' Fashion Show at the De Soto Hotel. This colorful beginning was followed with a delightful luncheon on the terrace of the hotel, a charming spot overlooking the hotel's swimming pool and attractive gardens.

After the luncheon the ladies joined with the men in making the trip to Palmetto Bluff and for the banquet during the evening.

The second day's program included bridge and golf during the morning; luncheon at the golf club; an afternoon at Wormsloe Gardens, a world renown beauty spot of the South, and in sightseeing; and the Crinoline Days dinner party during the evening.

No formal program was arranged for the ladies on the morning of the third day, but at noon-time they joined the men for participation in the activities at Tybee Beach and completed the day jointly with them with the buffet dinner during the evening.

Many of the ladies made the post-convention trip to Brunswick, Ga., on the P. M. C. Special, visited the naval stores plant the following morning, and had luncheon with the men at the Cloister as guests of Hercules Powder Company.

Machinery and Equipment Exhibition

A brief listing of exhibitors and exhibits will indicate tangibly the extent of the exhibition and the part it played in making the convention a success.

Bagley & Sewall Company, Watertown, N. Y.—Cutaway section of full size Simplex shake unit with motor and Link-Belt PIV drive; model of adjustable table roll bearing; model Lewis suction box; photographs of recently built Bagley & Sewall paper machines including 210 in. kraft machine at Crossett Paper Mills, Smith Paper Company cigarette machine and Clifton Paper Board Company machine (now in process of construction), and movies of Bagley & Sewall plant and of machines in operation.

Bailey Meter Company, Cleveland, Ohio —Six colored and framed diagrammatic drawings, mounted in a display background, showing metering and control equipment applied to a B & W-Tomlinson black liquor recovery unit; combustion and feedwater control installation; meter control installed on two pulverized coal-fired boilers; meter control installed on combination oil and bark burning boiler; and arrangement of meter control, pressure reducing desuperheating and steam distribution equipment in typical kraft mill.

Barkon-Frink Tube Lighting Company, Long Island City, N. Y.—Several models of lamps in operation; and a list of some of the mills using Barkon equipment.

Bauer Brothers Co., Springfield, Ohio—Large illustration of Bauer pulper; and display samples of different fibers treated

by machine, including groundwood, semi-sulphite, kraft, corrugated straw and kraft, book stock, kraft knotter rejects, semi-chemical black gum, and steamed southern pine.

Beloit Iron Works, Beloit, Wis.—Demonstrating model of latest wire changing device—model about 2 ft. wide and 8 ft. long from headbox to couch.

Brown Instrument Company, Philadelphia, Pa.—Large photograph showing applications for electric control valves, multiple recorders, dryer control systems, recording thermometers, electric tachometers, flow meters (process steam), and tachometers (remote indicating and recording); two flow meters; and a flow meter transmitter with section cutaway to show construction.

Cameron Machine Company, Brooklyn, N. Y.—Photographs showing mill installation and shop view of large winder; and samples of various kinds of rolls produced on Cameron equipment—silicon carbide paper, garnet paper, waxed paper, sealing tape, and paper for adding machines.

Philip Carey Company, Inc., Lockland, Ohio—Samples of raw materials used in Carey plant—cement, asphalt, Solka fiber, mica, burlap, cork, asbestos, slate and lime rock—on top surface of illuminated panel showing plant and process flow through plant; and samples of such Carey products as shingles, Caryeel insulated sheathing, Mica-Kote roofing, Careystone corrugated roofing and siding, Rocktex home insulation, caulking cement, and magnesia pipe insulation.

Crane Company, Chicago, Ill.—An 8 in. pulp stock valve; actual size photograph of 12 in. valve, seven feet high, with sections cutaway to show actual operation; and demonstration showing how disc of stock valve, a flat metal sheet rectangular in shape and with a cutting edge on the bottom, seats against a lead filler at bottom of valve body and in its downward movement forces any accumulated pulp from between disc guide in body to cavity at lower end of guide recess, thus providing outlet for the stock.

Dorr Company, Inc., New York, N. Y.—List of Dorr causticizing installations in kraft mills of the South; flow diagrams of Dorr system for waste treatment, recausticizing, and water purification—all arranged attractively on single panel; and samples of products at various points in the operating cycle of the black liquor recovery process, including re-burned lime.

Downingtown Manufacturing Company, Downingtown, Pa.—Moving pictures of various installations of suction rolls, extractor rolls and duo-dehydrating press parts with emphasis on rolls in the Charleston, S. C. and Covington, Va. mills of the West Virginia Pulp & Paper Company and in the mill of Manchester Board & Paper Co., Richmond, Va.; movie of Yankee fourdrinier in mill of Pond's Extract Co.; and several large photographs of suction press rolls and extractor rolls.

A group of TAPPI visitors inspecting Hercules plant at Brunswick, Georgia

General Electric Company, Schenectady, N. Y.—Enlarged photographs of G. E. equipment installed at Savannah plant of Union Bag & Paper Company; and display of splashproof motors, gearmotors, and magnetic switches.

Otto J. Goeppinger, 11 West 42d St., New York, N. Y.—A machine chest pump of Warren Steam Pump Company, a cleanable trim squirt and plug valves of De Zurik Shower Company; and Poirier vacuum control and Poirier weight governor of Sturtevant Mill Co. together with illustrations of Sturtevant bale pulper and Poirier control.

Goulds Pumps, Inc., Seneca Falls, N. Y.—Fig. 3105 pump, 4 in. size, for handling stocks at consistencies up to 6 per cent; Fig. 3158 pump, 2 in. size, for general service application; Fig. 3605 pump, 2S size, for handling alkalies where corrosion and abrasion must be resisted; "Close-Cupld" pump, 2H size, a compact and sturdy centrifugal for handling low viscosity liquids; and a new "Stockline" diaphragm gauge connection for measuring pressures in stock lines.

The diaphragm gauge connection consists of two recessed circular flanges with rubber diaphragm attached between them. One chamber receives stock, and the other, to which the gauge is attached, is filled with water and sealed. Stock runs through a 3 in. connecting pipe to the diaphragm while the pressure, transmitted through the diaphragm and water, actuates a gauge to give exact pressure reading. This connection prevents clogging of gauge with precipitated stock.

A. P. Green Fire Brick Company, Mexico, Mo.—Six types of fire brick; fireclay mixture; "Sairset," a high temperature bonding mortar, for laying and surfacing fire brick; and Quik Pach, a plastic fire brick.

Gruendler Crusher and Pulverizer Company, St. Louis, Mo.—A meeting and a resting place; and data on turbo pulp refiner.

Gulf Oil Corporation, New York, N. Y.—Illuminated display of photographs in which the lubrication of different items of pulp and paper mill equipment was stressed.

Hercules Powder Co., Inc., Wilmington, Delaware—Display cabinet showing samples of trisodium phosphate, aluminum sulphate, paracol 500, formaldehyde, alum (ground), evener No. 1, soda ash, Paracol 75, Ultroil, 151 A filler, rosin size (paste), foam killer, Dowicide, ultramarine blue, dry rosin size, sulphonated tallow, silicate of soda, sulphonated castor oil, casein, borax, dry gum rosin, sodium aluminate, and of flake caustic; samples of *The Paper Maker,* well known publication of the company; and movie of Hercules plant operations.

Hermann Manufacturing Company, Lancaster, Ohio—James d'A. Clark laboratory koller-gang; and a complete set of pulp testing and sheet making apparatus (British Standard).

Ingersoll-Rand Company, Phillipsburg, N. J.—Paper stock pump sectioned to show construction; and literature on complete line of equipment for pulp and paper industry.

International Nickel Company, New York, N. Y.—Display of seamless flexible Monel hose; "K" Monel doctor, Monel suction box, and Monel save-all tray as furnished by Rice, Barton & Fales, Inc.; Sinclair dandy roll covered with Monel flat mesh wire cloth; jordan filling and beater bar as supplied by John W. Bolton & Sons; De Zurik shower pipe; and black liquor evaporator tube. In addition, there was a panel display showing, in part, Monel covered felt rolls on press section of Pusey-Jones machine in mill

of Union Bag & Paper Corporation at Savannah.

Jeffrey Manufacturing Company, Columbus, Ohio—Electric vibrating feeder for salt cake; samples of conveyor chain for pulpwood; a conveyor belt idler; samples of knotter rejects and refined stock from rejects as prepared by Jeffrey screenings grinder; and numerous photographs of typical Jeffrey installations in pulp and paper mills.

Johns-Manville Company, New York, N. Y.—Samples of canvas jacketed pipe covering, Transite pipe, Eel Slip suction cover, metallic packings, Celite 263 for pitch control, JM-20 insulating brick, Neoprene No. 75 sheet packing, Style No. 600 brake band lining, asbestos metallic friction block, Superex and magnesia (combination) jacketed pipe covering—2½ in. thick, and of J-M asbestos.

Layne & Bowler, Inc., Memphis, Tenn.—Monel shutter screen; several pumping units with sections removed to show internal construction; and a series of impellers ranging from 4 to 24 in. in diameter for use in pumps ranging in capacities from 40 to 80 gallons per minute for the 4 in. impeller up to 800 to 5,000 gallons per minute for the 24 in. impeller.

Lightner & Smith, 420 Lexington Ave., New York, N. Y.—Panel display of photographs showing use of Automatic Transportation Company trucks for handling rolls, bales, and bundles in pulp and paper mills.

Lukenweld, Inc., Coatesville, Pa.—Model of steel dryer for paper machine which is now being introduced to the paper industry after several years of development and actual service use.

Norma-Hoffmann Bearings Corporation, Stamford, Conn.—Enclosed illuminated panel showing numerous bearing styles; group display of number of bearings without housings and others completely housed; and one large diameter bearing unassembled to show actual construction.

Oliver United Filters, Inc., New York, N. Y.—Latest designed screen sections; both rubber-covered and cast iron Oliver-Young valves; and enlarged photographs emphasizing the Oliver Kraft washing system and the Oliver-Young valve.

Permutit Company, New York, N. Y.—Photograph display of some Zeolite automatic softeners and filters, hot lime soda water softeners, oil removal filters, chemical feeds, Ranerex recorders and continuous blow off equipment.

William Powell Company, Cincinnati, Ohio—Numerous types of valves including 6 in. gate valve, 5 in. Misco C check valve, 4 in. Misco C angle valve, and 3 in. and 2 in. KA_2S valves.

Pusey & Jones Corporation, Wilmington, Del.—Large map of South carrying list of installations of Pusey-Jones machines in the territory—machines with a total productive capacity in excess of 1,000,000 tons annually, and an invitation for all delegates and guests to view the three huge machines in the mill of the Union Bag & Paper Corporation at Savannah.

Republic Flow Meters Company, Chicago, Ill.—Flow meter display; and photograph exhibit showing several typical Republic instrument panel boards and also a Smoot control application.

Rettelmyer & Company, Atlanta, Ga.—Representing Fisher Governor Company, Clarage Fan Company, Griscom-Russell Company, The Hayes Corporation, Terry Steam Turbine Company and Joseph Kopperman Company—Display showing Type J-111 low pressure copper expansion joint, copper element of high pressure expansion joint, Type J-110 flanged end equalizing ring, Fisher strainer with section cutaway, Fisher governor with section cutaway, and other typical Fisher governor units.

Rosenblads Patenter (American Heat Reclaiming Corporation, 1270 Sixth Avenue, New York, N. Y.; Fibre Making Processes, Inc., Tribune Tower, Chicago, Ill.; Paper Mill Equipment, Ltd., 670 Victoria Square, Montreal, Canada)—An A. B. Rosenblad condenser for low pressure vapors of cross current type and data and illustrations covering low pressure and vacuum steam condenser and condenser of counter current type as well as other heat exchanger equipment.

S K F Industries, Inc., Philadelphia, Pa.—Operating exhibit showing self-aligning characteristics of both ball and roller bearings; and display of large size of roller type bearing.

Strong, Carlisle & Hammond Company, Cleveland, Ohio—Line of steam specialties including Type K and Type C reducing valve, 80 series steam trap, forged steel globe type throttling valve, combination angle straightway type blow-off valves (Anum metal seats and discs), Evertyte valve, No. 530 thermal trap, and No. 70-T steam trap.

Testing Machines, Inc., 460 West 34th St., New York, N. Y.—Schopper tensile tester, freeness tester, bending fatigue tester, thickness gauges, paper weight scales, folding endurance tester, and rapid paper tester for ascertaining strength and elongation.

Texas Company, New York, N. Y.—Attractive and comfortable resting place.

Wallace & Tiernan Company, Inc., Newark, N. J.—High-capacity visible vacuum chlorinator for both fresh water and white water treatment; listing of its other control equipment, including automatic pH control, dry chemical feeders, bleach plant equipment and testing instruments for chlorine and pH; and literature on slime control.

Walworth Company, New York, N. Y.—A special pulp mill valve (Fig. 725 FS), Fig. 95 valve, steel gate valve—series 300, lubricated plug valves—class 150, check valve, angle valve, globe valve, cast alloy pipe section, threadless (Walseal) pipe fittings, pipe wrenches, and composite illustration showing various plants of company.

Williams Apparatus Company, Watertown, N. Y.—Laboratory equipment, including hand sheet mould, hydraulic press, penetration tester (oil, ink, acid, water), high speed electric centrifuge, electric smoothness and formation tester, graphic surface indicator, and combined precision freeness and air porosity tester.

Worthington Pump & Machinery Corporation, Harrison, N. J.—Type FP centrifugal stock pump for high consistencies and capacities up to 3,000 g. p. m.; rotating element of Type FP paper stock pump (combined screw radial vane impeller); Type CG Worthite chemical pump; Type CQ and CT Worthite chemical pump; 2 in. Worthite gate valve; and photograph display showing installation views of Worthington feedwater deaerators together with listing of typical Worthington boiler feed pump installations in the pulp and paper industry.

Yale & Towne Manufacturing Company, Philadelphia, Pa.—Moving picture feature showing line of materials handling equipment in actual use and including some pulp and paper mill installations.

A Deserved Commendation

The size of the meeting, together with the excellent attendance at technical sessions, and the general all around spirit of enthusiasm that prevailed throughout the entire period of the convention speaks well for the efforts of the convention chairmen and of the several committees. In fact, each individual who had any part to play in the planning of the convention or in the handling of the many details connected with it is deserving of a word of praise and may the satisfaction be his that comes from a job well done.

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◆ Austrian Plant Makes Wood Fiber Insulation

A new plant for the production of wood fiber has been established at "Kapfenberg Einod" in the province of Styria, Austria, and has been licensed by the patent rights of the "Fahrny Syndicate" in Zurich, Switzerland.

The raw material for wood fiber insulation slabs consists mainly of thin fir wood and soft wood waste. These are treated similar to pulpwood, which means a good utilization of lumber waste. The plant will have a daily capacity of 1,250 square meters, or 11,613 square feet. Actual production so far is lower and is estimated at about half the full capacity. Up to the present wood fiber insulation slabs were imported from several foreign countries, including Finland and the United States.

Twenty-Sixth Annual Safety Congress

THE twenty-sixth National Safety Congress and Exposition of the National Safety Council was held in Kansas City, Missouri, October 11 to 15, 1937. The estimated attendance of more than eight thousand people from all departments of public, industrial and home life, was believed to be greater than that of last year's congress held in Atlantic City, N. J.

The beautiful and orderly Kansas City presented accommodations in its spacious Municipal Auditorium that were most adequate and comfortable for holding the large schedule of section and group meetings, the President's Reception and Dance, the Annual Banquet, and the Safety Exposition. All scheduled meetings and events were but a stone's throw from the principal hotels.

Accident Trends in 1937

The Statistical Bureau of the National Safety Council presented in "Accident Trends in 1937" that the death toll from all accidents for the first eight months of 1937 was about 69,500. This was a reduction of 4,600 from last year's toll, but still it was the highest total for these months in any year except 1936. The decrease amounting to six per cent, occurred largely in excessive heat deaths, which dropped from an estimated 5,500 to about 1,000. There have been decreases in other types of home and public (not motor vehicle) deaths, but these were offset by advances in motor vehicle and occupational fatalities.

Motor vehicle accidents in this period numbered about 24,500, which was an increase of 11 per cent over the same period last year, and this was accompanied by an approximately equal advance in motor vehicle travel.

Traffic accidents among school children was 2,000, being slightly less than a year ago, while for adults 65 or more years old, there was an increase of about 27 per cent, bringing the total up to 3,700.

Deaths from occupational accidents this year reached a total of 12,500 by the end of August, an advance of nearly 7 per cent over the total for the corresponding months of last year. Gain in employment this year probably is the chief factor in this increase. Definite information on this point is available for manufacturing industries in which the U. S. Department of Labor estimates that in the first half of the year employment was 14 per cent greater than in 1936.

Home deaths showed an estimated decrease of 23 per cent for the first eight months. Deaths from public, other than motor vehicle, accidents decreased 8 per cent. Steam railroad accidents were responsible for 8 per cent more deaths and 11 per cent more injuries than in the corresponding months of 1936.

Annual Meeting of Members

The annual meeting of members was held on Monday morning, October 11, in the Music Hall of the Auditorium, Dr. C. H. Watson, medical director, American Telephone and Telegraph Company, and president of the National Safety Council, presiding.

Following invocation by Rev. Walter H. North, pastor, Country Club Congregational Church, Kansas City, Mo., the Congress was welcomed by Hon. Bryce B. Smith, Mayor of Kansas City. Mr. Smith cited the results of Kansas City's safety campaign. "Per capita fire losses have been more than cut in half," he said. "Traffic fatalities last year were 18½ per cent less than the average for the previous five years, and there has not been a child traffic fatality in Kansas City for more than a year. Such are the dividends of safety."

D. L. Fennell, president of the Kansas City Safety Council, welcoming the congress also mentioned the achievements of co-operative effort against traffic accidents, and the address by Hon. Lloyd C. Stark, Governor of Missouri, read to the assembly by Col. Marvin Casteel, of the state highway patrol, emphasized the State's co-operative safety progress.

Dr. C. H. Watson said, "The National Safety Council was originally founded to promote industrial safety. If men and women had continued to lose their lives in industry at the rate they were before the founding of the Council, 250,000 persons would not be living today.

"We realize there is a point beyond which we cannot go," he said. "There will be a certain percentage of inevitable accidents you just can't lick." He explained that motor car accidents resulted in about 40,000 fatalities last year and that almost as many accidental deaths occurred in the home.

"Safety," he said, "is a question of performance. Because people know what they should do does not mean they will do it. Yet everybody has the right to be safe; and just like good health, safety, in a measure, is purchasable."

Dr. Watson gave major consideration to the Council's biggest problem, *traffic safety*. "I don't believe," he said, "our high accident toll is the result of drunken drivers, carelessness and such things. No, I think they are because so many of us are exhibitionists.

"We get behind the wheel of a new car and we surrender to an exaggerated sense of our own importance.

"Courtesy is very important to safety. Traffic accidents will drop when we get drivers to stop that dangerous impulse to beat the red light, and to pass the other driver."

For industry, he saw some of its major problems to be the following:

Increased attention to simple and often neglected fundamentals of safe housekeeping, ventilation, mechanical safeguards, protective equipment.

Skilled medical supervision for all workers.

Continued research in the industrial materials, processes and methods of protection.

Job training and supervision to meet present day requirements.

Participation in community safety programs.

Public Safety Resolution

The report of the Resolutions Committee adopted at the annual meeting, resolved on Public Safety to "Take a fresh hitch in our belts on the Council's Five-Year Campaign to reduce accidents which was launched on a nation-wide basis January 1, 1936, defy the fact that the first two years of this plan have brought increases rather than decreases, and wade in and fight all the harder to put this campaign across."

A New Safety Die

A. A. Nicholson, manager of personnel, The Texas Co., New York City, addressed the meeting on "Industry Casts a New Die." He said, "The unending campaign for more efficient production must be accompanied with the search for more safety, a search that should unite employer with employees in a common goal."

Safety Today and Tomorrow

Dr. Miller McClintock, director, Bureau for Street Traffic Research, Harvard University, Cambridge, Mass., emphasized there is no substitute for organized action. He said safety was a community problem and would be met by community co-operation, as well as by education of the individual.

"Progress may seem to be slow," he said, "but the only substantial way toward safety is the co-operative way, based on the best knowledge we have."

Entertainment

The President's Reception and Dance was held on Monday evening in the main arena of the Municipal Auditorium.

The Annual Banquet was another one of those renowned affairs which the members look forward to each succeeding year. Hon. Harold G. Hoffman, Governor of New Jersey, and Vice-President for Public Safety, National Safety Council, was Master of Ceremonies. "New

Frontiers for Smart People" was food for thought in sparkling oratory by Dr. James S. Thomas, keen student and President of the Chrysler Institute of Engineering. A warm and inspiring address was made by Hon. Walter A. Huxman, Governor of Kansas. The award of the Motion Picture Traffic Safety Committee (dedicated to the memory of David S. Beyer, Liberty Mutual Insurance Co.) was presented by Dr. Miller McClintock, chairman, to Columbia Studios for its production of the picture, "The Devil Is Driving," starring Richard Dix. The entertainment consisted of music and stage revue.

Dancing with Harry Kauffman's swing orchestra, seven acts of vaudeville and a "Coney Island" lunch at midnight, was the program of the Safiesta, or Congress Fun Fest, held in the main arena of the Auditorium on Thursday night.

The Ladies' Entertainment program, arranged through the courtesy of the Women's Committee of the Kansas City Congress Committee, included a luncheon and bridge at the Kansas City Club, a sight-seeing auto trip through the City's shopping, industrial and residential districts, and a visit to the William Rockhill Nelson Gallery of Art and Atkins Museum, followed by a reception and musicale at the Kansas City Art Institute.

Exposition

More than a hundred displays of industrial and public safety equipment and modern methods were shown in the Exhibition Hall of the Municipal Auditorium. The interest shown in this wealth of safety information was gratifying to the exhibitors. A popular make of automobile was given free to the person who having qualified by the required number of registered visits, had the number in a drawing correspond with that of his punched ticket.

D. D. Fennell of Chicago Elected President

The National Safety Council's Executive Committee named seven vice-presidents and a managing director to serve with D. D. Fennell, consulting engineer of Chicago, newly elected president.

W. H. Cameron, Chicago, was re-elected managing director. He has held this position since the Council was founded in 1913.

Mr. Fennell, who succeeds Dr. C. H. Watson, brings to the presidency of the Council experience and enthusiasm gained in twenty years of active safety work.

Paper and Pulp Section

Meetings of the Paper and Pulp Section were spread over the four afternoons, Monday to Thursday, inclusive, in the Municipal Auditorium, and the regular annual luncheon was held on Thursday in the Muehlebach Hotel. One hundred and fifty people registered their attendance which was greater than at any previous annual meeting of this section. With few exceptions, the members of the Executive Committee of the section were present.

Review of Past Year's Activities—General Chairman George J. Adams, International Paper Co., briefly reviewed the section's activities during the past year and expressed his appreciation for the splendid work that had been done by all members of the Executive Committee in extending themselves during a year that was particularly trying and difficult for everyone.

Accident Statistics — Because of the pronounced interest being shown by a number of mills in the accident statistics which the section has been compiling under the supervision of F. W. Braun, Employers Mutuals, Wausau, Wis., A. E. Winslow, Hollingsworth & Whitney Co., and Ernest Augustus, The Mead Corporation, it was proposed at one of the Executive Committee meetings that some means of perfecting and continuing these statistics be taken for (1) improving the present form of report of accidents; (2) perfecting a plan for future tabulation, and (3) perfecting a plan for the presentation of the statistics to the section.

Program Meets Section's Wishes — Praise was given to Secretary F. A. Robinson, Kimberly-Clark Corporation, for his untiring efforts to provide a program for this congress which most nearly conforms to the desires of the section's members. The subjects and speakers represented the wishes of the majority of the members who returned a questionnaire that had been sent to them.

Engineering Committee Made Survey—D. B. Chant, The Ontario Pulp and Paper Makers' Assn., Toronto, Canada, chairman of the Engineering Committee, made a survey on sulphur handling hazards which was reported in the News Letter. He also supplied through the News Letter information concerning a number of fatal accidents which were doubtless valuable to members having similar hazards in their plants. Suggestion was made that the Engineering and the Health Committees, the latter under leadership of Dr. Edward W. Paine, Hollingsworth & Whitney Co., Waterville, Maine, be called upon more often for advice and help such as making surveys of troublesome problems.

Publicity and Other Committees Praised—Clayton Braatz, Marathon Paper Mills, editor of the section's News Letter, was praised and thanked for the excellent job he had done during the past year. Membership in the section had increased under the efficient leadership of A. E. Winslow, Hollingsworth & Whitney Co. Several ideas for posters had been promoted and forwarded to the National Safety Council for their consideration, by members of this committee under the leadership of J. H. Turner, Consolidated Paper Corporation. The Contest Committee reported record enrollments in the past and present year's contests.

Accident Experience Exchange

F. W. Braun, manager of safety engineering, Employers Mutuals, Wausau, Wis., presented in mimeographed form, the 1937 Summary Report of the Accident Experience Exchange in the Paper and Pulp Industry.

There was a total of 678 accidents reported, being a noteworthy increase over the total of 108 reported in 1936; 239 reported in 1935, and 300 reported in 1934. Sixteen tabulations comprised the report.

Table 1 showed the days and months on which the accidents occurred. The minimum number of reports were in June and July; reports in the remaining months were more or less evenly divided.

Tables 2 to 6, inclusive, divided the accidents into—(2) "Days of the Week," Monday to Thursday, inclusive, having the greatest number; (3) "Day or Tour Worker," showing the greatest number among the latter; (4, 5 & 6) "Times at Which Accidents Occurred" and "Time Worked Preceding the Accidents"—the hours of seven to twelve in the morning and one to five in the afternoon recorded the greatest number of accidents, and the highest number occurred after working five to six hours on the job.

Tables 7, 8 and 9 broke down the reports into "Age Brackets"—ages 20 to 30 years showing the greatest number; "Single or Married"—the latter ranking the higher, and all but seven accidents occurring to males; "Years in Employ of Company"—the highest total being in the period of one month to five years, and the greatest number of accidents during the periods of one to six months and three to four years.

Tables 10 and 11 broke down the accidents into departments and compared the reports of the past four years by number of accidents and days lost. The greatest number of accidents occurred in the machine rooms (paper, board, coating, roofing, etc.).

Table 12 exhibited the jobs on which injured were employed, and compared them with the reports in previous years. The highest number of accidents occurred to laborers; the next highest were about evenly divided between wood handlers, millwrights, machine tenders, finishers and loaders and shippers.

Table 13 was considered a most important exhibit, for it classified the accidents into the "Cause of Injury," "Slipping, Stumbling, or Tripping" totaled the highest number. "Falling, Slipping, Sliding, or Rolling of Logs, Rolls of Paper or Pulp, Bales, Sacks, Boxes, Cases, etc." totaled the next highest, and "Falling Objects" registered third. Large numbers of accidents were attributed to the following causes in the order listed: (a) "Lifting, Pushing, Pulling and Prying"; (b) "Falls of Persons"; (c) "Hand Tools Slipping or Glancing"; (d) "Handling Materials and Supplies"; (e) "Burns and Scalds."

Table 14 listed the accidents according to the nature of injury. "Bruises and Contusions" and "Fractured Bones" accounted for nearly half of the reported accidents.

Table 15 listed parts of the body in-

jured. "Hand, Thumb and Fingers" received the highest number of injuries, with "Ankle, Foot and Toes" running a close second. Over 30 per cent of the reported accidents were injuries below the knee.

Table 16 exhibited the machine, tool, or appliance with which the accidental injuries were connected. "Hand Trucks" accounted for the highest number, and "Calenders and Super Calenders" was a close second.

Continuation of Statistical Records Ordered—The Section voted to simplify and perfect the method of recording accident statistics and if possible to obtain the services of the National Safety Council's statistical staff and equipment for doing the work. A committee was appointed to discuss the matter with the headquarter's staff.

Methods of Obtaining Employee Interest—Thomas G. Henderson, superintendent, Bird & Son, Inc., Phillipsdale, R. I., presented a paper during the Monday afternoon session on *Methods of Obtaining Employee Interest and Co-operation in Safety.*

Management Must Take Active Part—"In the Bird & Son mills, two things are considered necessary to obtain and maintain interest and co-operation in safety," said Mr. Henderson. "The first is a sustained active and progressive attitude on the part of management toward the importance of accident prevention, with concrete evidence that they are willing to appropriate money for and give personal attention to safety matters, and the second, proper organization holding the superintendent and the foreman responsible for the success of the safety program, bringing in as part of the safety organization workers who are actually on the job."

Safety Committee Organization — Mr. Henderson described his company's safety committee organization, which consists of the Department Safety Committees and the Central Safety Committee. The department committees are each made up of the foreman as chairman and a few of his men. The Central Committee is headed by the vice-president in charge of manufacturing and made up of all the plant superintendents.

Department Safety Committee — "The foreman is directly responsible for accidents in his department," said Mr. Henderson, "and the committee is a means for him to combat accidents." They meet informally at least once a week to talk over dangerous or unsafe practices which they have observed, do what they think is necessary to keep their department safe, and to consider recommendations made by the various men. It is a custom of the company to change the makeup of these department committees at least once a month on the theory that by so doing all men, particularly the newer employees, will have a better opportunity to become versed in the safety idea. On the other

G. J. Adams, who was re-elected chairman of the Paper and Pulp Section

hand, since all superintendents have some latitude in the running of their safety committees, some plants make it a practice of keeping the same men on the safety committees for longer periods on the theory that the work is important enough to warrant the time of the best men in each department. Regardless of which plan is followed, he said, it is important to bring in the men on the job.

These department committees occasionally make inspections in other departments than their own, and sometimes are able to call attention to conditions or practices which men have become used to but which should be corrected. Recommendations are passed along to the superintendent who sees that they are carried out when he believes them to be practical. Some recommendations are passed along to the Central Safety Committee.

Foremen are required to come each morning to the superintendent's office and mark on a chart therein, the accident record for their departments during the previous day. A foremen's meeting, held twice a month in each plant, offers the opportunity for safety matters to be brought up if a foreman wishes certain ideas discussed. Here, after discussion, changes may be ordered, or recommendations made to the Central Safety Committee.

The Central Safety Committee meets once a month. It receives reports of the safety inspector, passes on recommendations of the various departments, and decides the general policy of the safety program. A safety inspector visits all plants at least once a month.

Instructing the New Man — The employment department explains to the new men the company's policy in regard to safety work, and the fact that he must work safely is impressed upon him before he starts to work, said Mr. Henderson. In addition to this, the foreman must see that the new man is fully instructed, and as a further impression upon him, the new man must sign an examination card before he starts to work. The safety inspector also makes it a practice to talk with each new man before a month has elapsed and satisfies himself that the man has been properly instructed. This same procedure is carried out when an employee is transferred to a new department.

Co-operation of the employee is dependent to a great extent on the attitude of his foreman and superintendent toward safety work. Frequent personal talks with him will go a long way toward the desired co-operation. He should be made to understand the direful effects of accidents and that the safe way to do his work is the only way approved by the company.

Accident Reports—Reports of all accidents requiring medical attention are sent immediately through the superintendent to the vice-president in charge of manufacturing. Detailed reports which follow later include first, the foreman's report giving description of the man, the accident, time and place, also what he thinks was the cause and what he has done to prevent its recurrence; second, the inspector's report giving results of his investigation, and third, the report of the nurse who sets down the employee's reason why the accident occurred, and what precautions have been taken.

Safety Incentives and Propagation—Mr. Henderson related some things which his company does to stimulate employee interest. Two shields have been provided as an incentive and acknowledgment of good safety work. One is held by the plant which has run the largest number of days since its last lost-time accident, and the other is held by the plant which has run the largest number of man hours without a lost-time accident.

Bulletin boards are placed where the men must see them every day. Up-to-date information and comment are placed on these boards, and National Safety Council posters are used and changed frequently.

In a company magazine devoted to items of interest to employees, publicity is given to all accidents and to all safety achievements. The standings of the various plants in the different contests are given, and various interestingly written writeups and cartoons are published. Safety calendars are distributed to all workers each Christmas. Time cards and pay envelopes are used as an opportunity for the presentation of short and attention-getting safety slogans.

Safety Shoes—The company carries in its storerooms a stock of a good brand of safety shoes, and advertises, recommends and otherwise encourages their use by permitting them to be purchased at cost and paid for in installments from the weekly pay checks. These shoes are constantly proving themselves to be good accident preventers.

First Aid Courses—Mr. Henderson said that his company sponsors—and encourages American Red Cross courses in first aid. Some employees have gone so far as to take advanced courses and have formed a First Aid Club which meets regularly through the winter.

In concluding, Mr. Henderson remarked that no organization in safety work should remain unchanged year after year, as there is much danger of getting into a rut, and a flood of accidents causes the company to wake up to the need of changing the whole safety program. Probably, he said, every safety program should be thoroughly overhauled at least once in five years to be sure that interest is maintained.

Elimination of Hazards in Boxboard Mills

Major hazards and their elimination in boxboard mills was the subject of a paper presented by E. W. Patton, safety director, The Lawrence Paper Co., Lawrence, Kansas.

"In boxboard mills where the dominant thought is production, little things are not usually given the attention they deserve," said Mr. Patton. For example, in the storing of raw materials, a poor arrangement of material is a formal invitation to an accident, and responsibility for this is squarely up to the safety man.

Poor illumination is a cause of many accidents. Unshaded lamps make dangerous conditions in nearby areas where vision of the eyes cannot be depended upon because of the difficult adjustment it requires. Good light is important to plant safety.

Burns are a common cause of injury, among the most prominent cases being uninsulated steam pipes, or insulated pipes where the insulation has been worn thin. Electric switches, connections and extension cords, especially when used near water or wet objects, present serious dangers if the means of contacting the current is exposed.

Maintenance work has always been subject to high accident frequency. Provisions for handling heavy material are sometimes lacking, and men are often required to lift weights beyond their natural physical capacity. After a man strains his back several times, he acquires a "trick back," and any time that man lifts a heavy object he may have a lost-time accident. When a regular job is finished, the superior should see that no tools or waste materials are left on the spot.

Handling of Waste Paper—Waste paper being the principal raw material used in boxboard mills, Mr. Patton pointed out, the handling of it in bales ranging from less than a hundred pounds to nearly a ton, presents hazards which cannot be completely eliminated unless mechanical means is substituted for man power, and in many cases this is not practical. However, careful training of the men, smooth trucking surfaces, and trucks kept in good working condition will eliminate most of the injuries from this source. Foreign objects in the bales, such as old razor blades, broken bottles, loose ends of wire, etc., constitute a hazard which is responsible for a high minor accident frequency. In the use of hand hooks for the moving and stacking of bales, many injuries occur. Proper instruction should be given in the use of such tools, and it is extremely important that they be kept in good condition at all times.

Clipping the wire which binds the bales, before dumping the waste paper into the beaters, is a hazardous operation. When the tightly drawn wire is cut, the ends fly out with lightning speed. Cuts, scratches and punctures on hands and face have been caused by this operation. Eyes have been put out by it. A satisfactory method of clipping the wires is to hold the wire firmly beneath one hand on the side of the bale and clip the wire near the corner. The loose end is then the short end that will fly around the corner away from the operator. Gloves offer effective protection for the hands in performing this operation. The wire should not be scattered about the floor; a safe practice is to wrap it up when taken off the bale.

Guarding continuous beaters that are generally located near the floor level, should be done to fit the particular conditions surrounding the beater. The guard is generally a substantial railing around the exposed section, leaving adequate space to permit feeding the waste paper into the beater with the least possible interference.

Board Machine Hazards—The slip hazard around the wet end of the machine demands that ample gutters and drains be provided along both sides of the machine to carry away the water so that it cannot spread over the floor. All footing surfaces should be kept free of oil and grease. Along the press section, small portable ladders are less dangerous than poorly shaped toe holds on the framework. However, the ladders must be of firm and adequate construction.

Skin punctures from needles used in repairing felts, and from wire in working around the screens will cause trouble if not given prompt medical attention. Weight levers and rods present a possibility of weights dropping on feet. When the weights are tied on by ropes or wires, there is danger that the vibration of the machine will free them. Different methods are used to eliminate this hazard. Bolts of sufficient size to hold the weights may be put in the end of the levers, or reciprocating notches may be put in both lever and weight so that no slip can occur.

Rubber press and felt carrying rolls are generally used in boxboard mills, and rubber nips have a tremendous pulling power. The danger of getting caught between felt carrying rolls is ever present. Accidents from this hazard occur most frequently when wrinkles in the felts are being pulled out and when the felt is being straightened by pulling the edge of the felt. When this is done in front of an in-running nip, the risk of being caught in the nip is great. Automatic straighteners eliminate this hazard. Where they are not in use, the risk can be diminished by proper instructions and rigid observance of them.

The propensity toward excitement when a bad run of breaks in paper occurs should be overcome as much as possible. Naturally, the men are anxious to prevent as much waste as they can. They are eager to get the paper started again, and loud talk only adds to their nervous tension and contributes to the confusion of the situation. A special effort should be made to discourage loud voices and excited action at all times around the calender stacks.

Handling the Finished Product—Hazards encountered in handling the finished product depend upon the method used. Cranes and hoists used in conveying rolls to storage or the shipping department, must be kept in proper condition. Trucks and tiering machines or stackers, like all other lifting and conveying apparatus have many danger points that the operators must constantly bear in mind. Usually two or three men work together on a stacker or tiering machine. It is extremely important that strict rules be made concerning the starting and stopping of this machine, so that the operator is aware at all times of what the machine is doing. Operators should be forbidden riding on the stackers, and warned not to be under the machine when it is being loaded or unloaded.

In concluding, Mr. Patton suggested that first aid courses be given to men in the mill. In one instance, where an employee had dug so far into the base of a pile of cooked stock that it caved in on him. On being taken out, there was no perceptible sign of life. The first aid team then did some effective work. During the ten or fifteen minutes required to get a doctor, artificial respiration was administered and the injured man was breathing again when the doctor reached him.

Place of Safety in an Industrial Relations Program

The second session of the Paper and Pulp Section was opened with an address by one whose identity and experience in the field of industrial relations needed no introduction. S. F. Shattuck, vice-president in charge of industrial relations, Kimberly-Clark Corporation, was present at the organization meeting of the National Safety Council, held in Milwaukee in 1912, and when the Paper and Pulp Section was organized in 1916, he was elected its first chairman.

The subject of Mr. Shattuck's talk was The Place of Safety in an Industrial Relations Program, and it is herein presented with but slight omissions as follows:

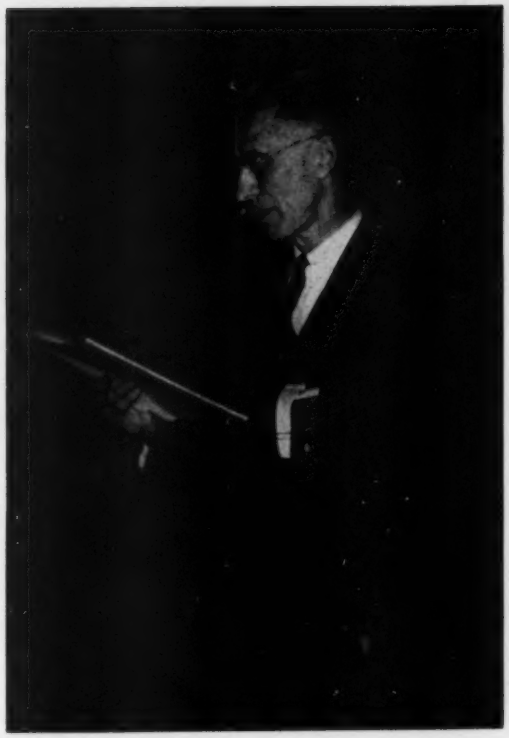
It may be truthfully said that, in many institutions, the safety movement as it took shape in the early years of this century, blazed the trail for present day industrial relations programs.

Measuring Stick of Industrial Relations—"Before discussing safety's place in the picture," he said, "let us look somewhat critically at the industrial relations program itself. What are its objectives? By what is its soundness measured?"

The more obvious tests of industrial relations would be in terms of tangible factors such as wages, hours, working conditions, supervision, and the like. But should we be satisfied to stop here, we would be left on the surface. Wages, hours and working conditions are effects, not causes. They demonstrate the sincerity of the program but do not necessarily reflect its motivation. An industrial relations program that touches people where they live deals primarily with motives, attitudes, habits and loyalties.

"Above all," he said, "our policies and techniques must take into account the significance of the individual person. The desire for individual recognition is as basic as is the desire for money."

Thus the test or measuring stick of our industrial relations program is found in the realm of intangible, rather than of tangible factors,—in spiritual rather than material values. "I appreciate," he said, "that this word 'spiritual' is not readily accepted by the practical supervisor whose pay and progress are measured by his ability to produce marketable goods at low costs. Any phrase with the word 'spiritual' in it seems to have an otherworldly flavor. Yet we are dealing with spiritual factors, and the most efficient managers and supervisors demonstrate the most skill in dealing with these intangible elements."



S. F. Shattuck, who was first chairman of the Paper and Pulp Section, addressed the Section on Place of Safety in an Industrial Relations Program.

Importance of the Individual—Industrial Relations programs these days, the speaker said, must be geared to something more fundamental than production demands. There is a social awareness abroad unlike that of any former post-depression era. The survival of the enterprise order, or capitalistic system, depends more than we may realize on the quality and level of relations and programs which take shape within industry during the years just ahead.

Some of the typical criticisms leveled against the enterprise order with which we are identified, he said, are as follows:

(1) The system operating as it does with self-interest and the profit motive at its core, sets definite limits to the operation of active good will between men. Class conflict becomes inevitable. Capitalism is based on strife.

(2) In setting limits to the operation of active good will, the system creates a destructive conflict in the lives of individuals who are sensitive to spiritual values. In other words, the so-called Golden Rule cannot operate in modern industry because the economic framework of the enterprise order is alien to it.

(3) Our economic life, they assert, is characterized by the substitution of corporate for individual ethics. Modern capitalism, by its very mass character, tends to obscure moral issues and to dissipate individual moral obligation.

For purpose of this discussion, Mr. Shattuck said, these three criticisms are segregated, all of which focus upon the importance of the individual. We, of course, recognize the interrelation of economic and political factors in this complex problem, but we will perhaps agree with Professor F. A. Magoun when he said to the Summer Sales Conference of the New England Gas Company, "The fundamental problem underlying every other problem of human endeavor is the problem of human relations." Try as we may to treat people in the mass, the significance of individual personality reasserts itself. In the long run, every human institution is judged by what it does to individual lives and personalities.

Two Extremes in Human Values were revealed by the speaker: on the one hand, the scientist finds that the human body shakes down to about 98 cents worth of chemicals; on the other hand, the late Michael Pupin, of Columbia University, after a long life of research into the mysteries of the physical universe, made this observation shortly before his death in 1935:

"These big hot stars are only the beginning of God's creative energy, the beginning of cosmic history. But the human soul, insofar as science can penetrate, is the last chapter of this history so far as it has been written. The soul of man is the highest product of God's creative handiwork."

How different one's attitudes and policies, depending upon which of these bases one accepts as a foundation for his life philosophy, said Mr. Shattuck. It is understandable, therefore, that men, women, and even little children, have here and there down through our industrial history been used like cogs in a machine—as means to a materialistic end rather than as ends in themselves.

Discounting all the racketeering in present day social and labor movements, there remains a solid residue of social insistence that modern, mechanized industry give proper recognition to individual personality. True, he said, this is a confused social insistence because mass movements obscure it. But let us be clear that we deal here with a fundamental desire. In spite of mass movements and political distortions, management has in this fact of life a pathway to normal relations within industry. Mr. J. David Houser expresses it aptly in these words: "What the employee wants in the situation where he spends half of his waking hours, and most of his energy is exactly what every human being asks of life: respect for his personality, his human dignity, an environment that he comprehends, and a sense that he is progressing."

Laws No Guarantee of Friendly Relations—Within the past four years, federal and state legislation has entered the field of industrial relations with new emphasis. Some stagnant situations, we know, need the physic of the law to start movement, but the law does not discriminate between the sick and the well. We observe other situations in which normal and friendly relations between men and industry have become all but impossible due to the maize of fine spun legalism now governing our industrial life. Out of the confusion and the fight for power between major labor organizations, one fact becomes clear: you can't get cordial and friendly relations by

passing a law. Whenever one finds a satisfactory industrial relationship, it has come from the inside out, not from the outside in.

Respect for Personality—Our sense of futility at times whets our appetites for a hold on those timeless principles which operate at a deeper level than man-made law. If we were to single out but one such principle—more potent and more applicable to industrial life than any other, it would be the principle of respect and reverence for personality that Dr. Pupin and Mr. Houser suggest in the remarks above quoted.

Courtesy in daily human relations is well nigh indispensable, but do we realize true courtesy cannot exist apart from the operation of the above principle? Democratic institutions rest upon a working belief in the capacity of the common man, which is another application of this principle of respect for personality. By the same token, the enterprise order in a democracy must tune its policies, its attitudes and its programs with this idea, or in time suffer the social consequence. Over the long swing, this concept of respect for individual personality is as searching as the photo-electric eye when turned upon the procedures of hiring, transfer, promotion, demotion, release, overtime, education and training, safety, and all the other relationships between management and individual employees.

"Note, in imagination," the speaker said, "what its operation does to the criticisms against the capitalistic order mentioned earlier in this discussion. Is there one of these criticisms that is not modified or nullified by an active application of the principle of respect and reverence for personality? Furthermore," he said, "is there another social order that is automatically free from the same criticisms?" The late Arthur T. Morey, general attorney of the Commonwealth Steel Company, once said when speaking of this principle as applied to industrial relations: "I am convinced that consequent to such sanity would come an affluence in stockholder's dividends, as well as otherwise that we now but little comprehend."

Safety's Place—"Now let us see where and how safety fits into this ideal industrial relations set-up," said Mr. Shattuck.

(1) First of all, the safety program meets the acid test of respect for personality. When we co-operate for safe working conditions, it is for the safety of individual men and women.

(2) The saving of waste is an objective of the safety program and what is more wasteful than the needless sacrifice of human skills and abilities?

(3) A thorough-going safety program within industry has a definite relationship to public opinion. It is agreed that the prevailing attitude of the public toward the corporation is something that merits serious attention. It might also be agreed that any program looking to improved public relations cannot rise above the level of industrial relations inside the plant. Unless and until these internal relations will bear the light of day, and until the program for wooing the public meets the approval and merits the co-operation of men and women in our shops and mills, let us be discreetly silent. On the other hand, any reasonable change in the public attitude toward industry can be achieved with the backing and support of employees. They know their communities and their word carries conviction. Therefore, if the premise is accepted that public relations have their roots in relations within the plant, where can we turn for a feature that offers the degree of mutual interest that is inherent in a well ordered safety program?

(4) In the safety program we have a morale builder of the first order. Just as safety was the vestibule through which modern industrial relations programs entered, so it may be the binder that holds it together.

Election of Officers

The report of the Nominating Committee presented that the year just closed had been one in which all members of the Paper and Pulp Section had been engrossed in the production demands of their respective plants. Under these circumstances that existed in company affairs, it was gratifying to note that the Executive Committee had been remarkably successful in leading the section through one of its most active and successful administrations. In appreciation of this record, the committee recommended that a vote of thanks and confidence be given to General Chairman George J. Adams and his staff in the form of re-electing each of them for another year. The report was accepted and the recommendation passed unanimously. The name of E. W. Patton, Lawrence Paper Co., Lawrence, Kansas, was added to the list of Members at Large.

Demonstration of Conference Method

Group instruction by use of the conference method was next exhibited in a practical demonstration of the accident investigation method. The demonstration was in charge of N. B. Giles, agent of industrial education, Office of Education, Washington, D. C. The group which was headed by H. G. Noyes, Oxford Paper Co., consisted of the following: W. A. Gleason, Hammermill Paper Co.; J. J. Hastings, Port Huron Sulphite & Paper Co.; George J. Adams, International Paper Co.; D. B. Chant, Ontario Pulp & Paper Makers' Ass'n; E. H. Rector, Kimberly-Clark Corp.; H. O. Eiken, Vocational School, Appleton, Wis.; D. C. Hunter, Oxford Miami Paper Co.; J. J. Plzak, Consolidated Water Power & Paper Co.; Clayton Braatz, Marathon Paper Mills Co.; E. E. Grant, The Crystal Tissue Co., and A. E. Winslow, Hollingsworth & Whitney Co.

This was followed by a demonstration of instructional methods in accident prevention. D. B. Chant enacted the roll of a worker becoming injured on a job assigned to him by his foreman, E. E. Grant. The assumed lack of all that would be expected of intelligent direction and safe practice was the cause of amusement and laughter, but the lesson was impressed deeply in Mr. Giles demonstration of the investigation of the accident.

Safety Rule Penalties

The strong and weak points of safety rule penalties was the subject assigned to L. Russell Simpson, safety director, The Brown Paper Mill Co., Monroe, La., at the opening of the third session on Wednesday afternoon. The paper was an unbiased presentation of a debatable topic, for it seems that some leaders can get along without enforcement, while others use it at times when needed.

"A study of this part of safety," said Mr. Simpson, "leads into the fields of health, placement, training, psychology and many other phases of safety and personal work. Naturally, there will be more violations of rules in a plant where there is not much regard for health, where unsafe conditions are not cared for, where there is no systematic training program, where all employees are treated alike and not as individuals, and where no personnel policy is in effect."

Why Are There Rules?—As a preface for thought, the speaker asked why we have rules. Why do men violate rules that are put into effect for their welfare? All games have rules, he said. Even life has rules to guide us to live well. We have civil laws, nature's rules and divine rules. The game of football is taken very seriously by our American public. In this game there is a rule about slugging. A player slugs and is removed from the game. He lost control of himself and was penalized. If the referee had let him get by, it may have resulted in something serious. There is some quality we admire in a man who can control himself and conform to conventions.

"Why do men get hurt?" he said. "They value their eyes, limbs, hands, fingers. Money could not buy them. They believe in accident prevention. They value the work that is being done in their behalf.

"The article written by Mr. Heinrich, Travellers Insurance Co., analyzing an accident, has done more to cut out penalty and enforcement than anything on any subject that has been discussed in our plant," said Mr. Simpson. The four steps in the accidental injury are as follows: (1) The employee; (2) Due to the fact that he is subject to mental ailments such as worry, fear, anger and such, and has weaknesses that human beings suffer from, causes him to do things that are unsafe, they are called unsafe acts; (3) The unsafe acts bring the accident, and (4) The accident brings the injury. Each step is separate and distinct. Cut out any of the first three and there would be no injury.

It is not safe to assume that a man who has been on the job a long time will be a safe worker all the time. One day he is a safe worker and the next he may violate a rule he has followed for years. New processes and changes in machinery and methods take place daily. The employee must be trained to meet these changes.

Some of the trophy winners in The Paper Industry Safety Contest. Back row (left to right)—G. W. Phillips, Champion Paper & Fiber Co., Canton, N. C.; Harry Guilbert, vice president National Safety Council, who awarded Council's plaques and certificates; E. E. Grant, Crystal Tissue Co.; J. H. Turner, Consolidated Paper Corp. Front row (left to right)—Arthur E. Winslow, Hollingsworth & Whitney Co.; Ernest Augustus, The Mead Corp.; T. G. Henderson, Bird and Son, inc., recipient of major trophy; G. J. Adams, International Paper Co.

Weak Points in Penalty System—Mr. Simpson next took up the two sides of the subject, the weak and strong points of penalty for the violation of rules, and considered first the weak points.

The penalty system has a tendency to create a fear complex, hard feelings, and breaks down morale in an organization, he said.

Penalties are considered by some as short cuts to desired results. But are they lasting results? The penalty system assumes a type of discipline that says—*If you are to blame for violating a rule, you are fired. If you make a mistake, it will be too bad.* Any man that does anything makes mistakes. We are human beings who are prone to err. Men will not be entirely happy where there is fear or loss of job.

Penalties are sometimes a substitution for lack of a training program and poor foremanship. When a foreman accepts the responsibility for safety, the following qualifications are necessary for accomplishment and results: (1) sympathetic understanding of the individual working under him; (2) ability to enthuse them, and (3) an appeal to the emotions. He must further remember that most accident prevention work falls under three heads: (1) find the hazards; (2) get rid of them; (3) stop exposing people to hazards. The last sometimes means the changing of habits and practices of employees that is at times hard to do.

Penalizing tends to shift responsibility from leadership to employees. Most accidents thoroughly investigated point the finger of blame on leadership. A rule states in no uncertain terms that a man should do a certain operation a given way. Time and again this is not done and the foreman allows it to go on to his knowledge. It would be surprising sometimes to see how many employees know the rules. Words are not always sufficient. Writing is not always sufficient. It should be made sure that instructions and rules are known definitely.

Many leaders know the technical part of their jobs so much better than that part which requires intelligent handling of men. All foremen are not teachers. Glenn Gardiner tells us that there are four steps in teaching: (1) telling; (2) demonstration; (3) testing, and (4) checking. A foreman may be fine on telling but weak on making allowances that words can be misunderstood and leave the rest to chance.

Rules should be sold just as a commodity is sold. Penalizing indicates lack of salesmanship. "Do we try before a rule is made," said Mr. Simpson, "to get the men concerned together and agree on the necessity of such? Men do not get much stimulation out of violating something which they helped to make and agreed upon. They stand for it. They will fight for it."

Individuals differ in many respects. A rule is not interpreted the same by different people. This is a statement by a noted psychologist: twenty-five per cent of public school children cannot be educated beyond the 5th and 6th grades. In normal times there are approximately three million employables. There are four aspects to maturity: (1) chronological age; (2) intelligent age; (3) emotional age; (4) body age. All these facts must be considered in rules, enforcement and violations.

Thou shalt and thou shalt not tends to mechanize human beings when it is followed by punishment. It retards initiative, progress and individual thinking. A machine can be controlled because it is not endowed with a brain. Man is controlled by sympathetic understanding, appeal to motives and emotions. A man in the state of mental depression may stray from the path of safety and be punished for his waywardness when others who may have committed the same acts are never caught and do not suffer the penalty. There will always be the doubt of fairness and square dealing in his case.

When a man who violates a rule is laid off, fired and dismissed from the job, some one must replace him. This leaves a gap in the organization of producing a product. In many cases the replacement must be trained and production suffers. Employee turnover is costly.

Penalties influence men differently. If we can get men to believe in us, have faith in us, respect us and believe in our leadership, we can earn a place in the hearts of men that rules, punishment and penalties can never reach.

Strong Points Favoring Penalties—"There are many strong points in favor of the opposite system—enforcement, penalty, punishment, used by intelligent, sensible leaders the world over," said Mr. Simpson, in trying to present both sides of the question. These follow:

Making an example of the employee educates the force in accident prevention and creates a strong company policy in reference to safety. Some companies have experienced high rates of accidents of certain types such as eye injuries. Everything

has been done in the way of coaxing and pleading to get the men to wear goggles when needed. Yet eye injuries continued. These same companies have made hard and fast rules with penalty attached for violating them and have been successful in stopping these injuries.

Many companies advertise their cases that penalties are used. This is done in order that the entire force may know what has happened. They feel it gets the safety program over. It has its effect, true. But on the other hand, is this the best method?

Rules teach self control. Self control is obtained by submitting to rules and law. Respect for rules will not be possible where self respect is lacking. This quality is lacking in some individuals due to habits of conduct. A man that has self respect has more of a tendency to respect the rules of others. You may give a man rules, safe practices, conventions, but he will never respect or obey them unless he has some respect for self.

"It saves lives" is perhaps one of the strongest arguments for the enforcement of rules, said the speaker. If enforcement of rules was a popular practice without favor, hundreds of people, yes thousands and millions would be alive today who died from sudden death, and others would not be maimed for the rest of their lives. There are many plants that do not want to be partnership to serious accidents and loss of lives. If it takes this, they say, we will enforce the rules.

Fear of penalty has a good psychological effect, and this is the last thought on the strong side, said Mr. Simpson. Many organizations have always imposed penalties for violating operating rules with good effect. It is therefore reasonable to expect that the same effect will be secured in safety rules and practices. Safety is an operating function and should not be separated from operation.

Summary—The following thoughts were given by Mr. Simpson in summarizing his discussion. To obtain obedience to rules, this should be followed: Have no rules except necessary ones; the men must understand them; management through foremen and the safety department should be sure that all employees are acquainted with the rules and understand them; penalties should have careful consideration, and investigation of violation should be in order; when a man is injured the time lost and suffering is, in most cases, sufficient punishment.

Management's Function in a Safety Program

Management's function in the safety program was set forth in a paper by G. W. E. Nicholson, production manager, Southern Kraft Corporation, Panama City, Fla. The author was unable to be present at the meeting and the paper was read by Mr. J. J. Plzak. An abridgement of the text follows:

One of the most important industrial problems of today is the relationship between the management and the workers. Such a relationship can be successful in the long run only if the dealings are frank and honest; or in other words, the basic principle must be mutual confidence and respect. On this basis, safety work and safe working conditions become part of the functions of the management in the same manner as efficient operation is required. It becomes the duty of the management to take care of the training of men in the habits of industry, safe and efficient habits. A new worker follows the example of the older men and his foreman. Therefore, his training must be done largely by the foreman.

The top management must formulate the policies of the safety program, which it must also actively support from time to time and arouse an enthusiasm down through the supervisors to the employees. A wholesome, intelligent and friendly relationship, and the closest co-operation between the management and the employees is absolutely necessary to successfully eliminate accidents. It is only by active participation by the employees that a successful safety program can be carried out. It is a matter of team work and joint responsibility.

Safety Framework—The framework of the safety organization will naturally depend upon the type of industry and size of the plant. However, there are certain generalities which will be common to all cases.

The first step, and probably one of the most important is to carefully select the new employees. Age, physical fitness as determined by medical examination, intelligence, clean living habits, background and previous record should be carefully investigated and considered.

The newly accepted employee should be properly instructed about his work as well as unsafe working conditions. It should be very clearly understood by every foreman in the plant that he must take especial interest in every new man he puts to work. He must be patiently instructed and kept under constant watch until the foreman is positively assured that the new worker is capable of performing his duties efficiently and safely. The new employee is definitely the foreman's particular responsibility.

The Safety Program—Every safety program should include: First, Accident Facts; second, Elimination of Hazards; third, Safety Program; fourth, Creating a Safety Record; fifth, Safety Publicity; sixth, First Aid.

Accident Facts—An accurate knowledge concerning how and where accidents happen, the nature of the injuries, and source of accidents, and the number of accidents occurring is necessary to reduce accidents. A careful study of these facts should guide preventative efforts.

All accidents should be investigated, particularly the lost time cases, either by the safety director or a committee consisting of department heads especially appointed for the purpose. Proper records of such investigations should be filed.

Creating a Safety Record—Intensive educational work among employees is necessary to achieve a good safety record. The first step in the educational safety activity must be to win the confidence and support of the employees. It is only through close supervision and continual carefulness by the employees that a no-accident record can be obtained. Rigid enforcement of every order issued will get results. Good housekeeping throughout the departments, strict enforcement of rules, constant watchfulness for laxity, regular and thorough inspection of all operations will bring to light the underlying causes of accidents assigned to man failure.

The management should take the lead in plant housekeeping by creating a spirit of orderliness and system through the supervisors and foremen, and in generally insisting upon good housekeeping in all operations.

Foreman's Responsibility—The success of safety work depends very greatly upon the foreman, since a competent, protected working force rests largely upon his ability to lead and inspire confidence among those under his direction. The foreman can secure full co-operation of all employees more quickly by giving each man a definite responsibility, than by presenting the safety program solely in the form of instructions and orders. The employees should have an active part in accident prevention work, develop enthusiasm and the feeling that the success of the program depends upon his individual efforts. It gives each worker an opportunity to accomplish something that the employer desires. He feels that it is a personal service, which gives him much pleasure.

The vast majority of industrial accidents is caused by man failure, which can only be controlled by supervision. Failure to issue and enforce instructions, inattention, poor discipline, improper and unsafe practices, and undue haste are conditions which cause accidents. The foreman must believe sincerely in accident prevention. He must exert every effort to protect the man, and he must be a leader who can secure the whole-hearted support of the employees. If the foreman is indifferent, the workers will be indifferent, and he should give consideration to the effect of his actions and words on the worker in creating the correct mental attitude.

Special Campaigns—Special safety campaigns or contests between the departments will create and maintain interest in the safety work. Bulletin boards containing displays of safety posters, notices of contests, letters from the management are effective in keeping safety before the employees. Publicity should be used mainly in order to keep the safety movement alive.

Another splendid aid in safety work is the suggestion box planted at different locations where the men can drop their suggestions. These should be examined and decided upon by either the safety director or the safety committee especially appointed for the purpose. It is very important that such suggestions are not neglected or put off, but should be carried out promptly.

For the best record among 139 mills participating in The Paper Industry Safety Contest, this trophy was awarded by Edward B. Fritz, publisher, to the Phillipsdale, R. I., plant of Bird and Son, inc. Inset—Thomas G. Henderson, superintendent of the winning plant, who received the trophy

An Employees Committee is another useful agency for safety work. This should meet from time to time and at which meetings a representative of the management should be present and give short talks.

First Aid Hospital—One of the most important features in any safety organization is the First Aid Hospital, which should be well and efficiently managed. The nurse in charge should keep in close touch with the various safety agencies in the plant, whether it is the safety director, the Safety Council, employees committee, or management. First Aid facilities provided for employees by employers create a feeling of protection, and employees respond to safety activities much more whole-heartedly, as they feel that the employer is doing his part.

Another very important agency in a successful safety program is the resuscitation team. Training in resuscitation should be given continuously, so that in due time a great number of men around the plant can carry out such work whenever required.

No safety plan is complete unless a progressive educational program is included, which should apply to vocational education as well as high morale, and instruction and training for the foreman. Such an educational program should be based upon the personal interest in the employee, and that everything is done in order to make the plant a safer and more pleasant place for the man to work in.

Open Forum Period

The closing hour of the third session was designated on the program as an open forum for newcomers and old-timers. G. J. Bienvenu, of the N. O. Corr Box Co., Inc., Bogalusa, La., spoke on behalf of the Re-manufacturing Group in the Paper and Pulp Section. Appeal was made for more special study of the accident prevention problems in these paper and board converting plants, where the raw material is purchased and made into boxes, bags and paper specialties. Opinion was expressed that the common hazards incident to the process machinery in these plants should be classified separately from those in paper and pulp mills, and a place designated on future programs for their discussion.

M. D. Kossoris, of the U. S. Bureau of Labor Statistics, Washington, D. C., spoke of the work that is being done by the Labor Department in the compilation of accident and compensation statistics. These statistics are being collected, he said, from about 30,000 firms in fifty-five different industries, making them a representative cross-section. A new and valuable publication now being completed by the Department is a manual of accident statistics and analyses, showing among other things the causes of accidents, and this will be ready for distribution early next spring. Much valuable information is available from the U. S. Department of Labor on accident statistics, state codes, etc., that all interested people should make use of, said Mr. Kossoris.

The Annual Luncheon

The customary enthusiastic interest in the results of the Annual Safety Contest of the Paper and Pulp Section brought a good attendance at the Section's luncheon in the Muehlebach Hotel on Thursday. Copies of the final report and rankings of the contestants were distributed, and data on the 1936-1937 Contest was presented by A. Scott Dowd, of THE PAPER INDUSTRY and chairman of the Contest Committee, as follows:

Data on the Contest—The 1936-1937 Contest of the Pulp and Paper Industry had an enrollment of 139 mills and re-manufacturing plants; 126 of these units remained through the entire period which exceeded the number of participants in any previous contest.

The total number of hours worked by over 56,000 employees was 123,612,000. This exceeded the exposure in any previous contest in the paper and pulp industry.

The average frequency rate for all participants was 16.301, which is slightly higher than the 1935-1936 Contest rate of 15.096. However, frequently rates in the paper industry contests have been reduced 17 per cent since 1933 when production curves began their upward trend. It is also worth noting that the frequency rate of the late contest was more than a point lower than the 17.59 rate of the 198 mills reporting to the National Safety Council for the year 1936.

Contestants in the Paper and Pulp Division had an average rate of 16.861 in comparison with 9.041 for participants in the Paper and Board Re-manufacturing group, Division Two.

The largest mills in the paper and pulp division, composing Group A, easily had the lowest frequency rates by averaging 14.198. Contestants in Group C of this division had the highest frequency rates, averaging 25.318. Group A and Group D lowered their previous year's frequency rates.

Seven contestants went through the entire year without a single disabling injury. Five of these were in Group D, and two were in the re-manufacturing division.

One hundred and forty-six plant units are now enrolled in the 1937-38 Contest. During the first two months, 46 of these units operated without a lost-time accident. The average frequency rate for all participants in the two-months period was 14.502, a reduction of four points

HISTORICAL REVIEW OF THE PAPER INDUSTRY SAFETY CONTEST

Year	No. of Mills	Man-Hours Worked	Employees	Number of Disabling Injuries	Frequency Rate	No. of Employees per Injury	Mills with Perfect Records
1936-1937	139	123,611,911	56,470	2,015	16.301	28	7
1935-1936	130	100,491,110	45,915	1,517	15.096	30	14
1934-1935	110	86,867,184	42,378	1,439	16.566	29	12
1933-1934	105	71,436,322	34,132	1,402	19.626	24	6
1932-1933	98	60.772,518	34.709	829	13.641	42	11
1931-1932	131	74,569,954	32,454	1,044	14.000	33	9
1931 *	125	48,715,543	39,796	787	15.744	52	15
1930 *	124	47,343,549	36,153	986	20.826	37	11
1929 *	123	49,776,515	36,916	1,311	26.337	27	6
1928 *	122	47,673,816	36,357	1,355	28.422	27	8
1927 *	119	43,802,804	33,786	1,468	33.514	23	6

*Contest period January 1 to June 30.
October 1937—325.

from the rate in the corresponding period of last year.

The rules for the 1937-1938 Contest are the same as for the previous year.

National Safety Council Trophies Awarded

Ten beautiful bronze plaques and seven engrossed certificates were awarded to the winners of the 1936-1937 Paper Industry Safety Contest, by Harry Guilbert, director of Bureau of Safety and Compensation, Pullman Co., Chicago, and newly elected Vice-President for Membership, National Safety Council.

Mr. Guilbert's jovial remarks added much to the jovial spirit of the occasion, and with words of praise for the Section's splendid accident-prevention record, he made the following awards:

DIVISION ONE

Group A

Rank 1 (Trophy) — Hollingsworth & Whitney Co. (Algonquin & Taconnet), Waterville, Maine.
Rank 2 (Certificate)—Consolidated Paper Corp., Ltd. (Belgo Div.), Shawinigan Falls, Quebec, Canada.
Rank 3 (Certificate)—The Champion Paper & Fibre Co. (Canton Div.), Canton, N. C.

Group B

Rank 1 (Trophy)—Hoberg Paper Mills, Inc. (Hoberg Div.), Green Bay, Wis.
Rank 2 (Certificate)—St. Croix Paper Co., Woodland, Maine.
Rank 3 (Certificate)—Southern Kraft Corporation (Continental Div.), York Haven, Pa.

Group C

Rank 1 (Trophy) — Escanaba Paper Company, Escanaba, Mich.
Rank 2 (Certificate)—The Crystal Tissue Co., Middletown, Ohio.
Rank 3 (Certificate)—Strathmore Paper Co., West Springfield, Mass.

Group D

Rank 1 Perfect Score (Trophy)—Bird & Son, Inc., Phillipsdale, R. I.
Rank 1 Perfect Score (Trophy)—Rogers Fibre Company, Inc. (Fibreboard Mill No. 1), Bar Mills, Maine.
Rank 1 Perfect Score (Trophy)—The Mead Corporation, Nashville, Tenn.
Rank 1 Perfect Score (Trophy)—Central Fibre Products Co., Vincennes, Ind.
Rank 1 Perfect Score (Trophy)—International Paper Co. (Riley Mill No. 23), Chisholm, Maine.

DIVISION TWO

(Re-Manufacturing Group)

Rank 1 Perfect Score (Trophy)—Container Corporation of America, Anderson, Ind.
Rank 1 Perfect Score (Trophy)—Bemis Brothers Bag Company, East Pepperell, Mass.
Rank 3 (Certificate)—Bird & Son, Inc., Norwood, Mass.

The Paper Industry Trophy

On behalf of Edward B. Fritz, publisher of THE PAPER INDUSTRY, Chicago, who regretted his inability to be present, Mr. Dowd awarded Mr. Fritz's major trophy to the mill which the judge decided had made the most outstanding record in the contest, based upon (1) frequency; (2) man-hours worked; (3) physical conditions, and (4) other contributing factors.

The award was made to the Phillipsdale, Rhode Island, mill of Bird & Son, Inc., whose record in Group D was a perfect score. One hundred and thirty-eight employees in this mill had worked 312,774 man-hours without a lost-time accident for the year's period of the contest. More than this was the fact that the mill's last lost-time accident was on March 1, 1934, and therefore, the mill had actually operated 1217 calendar days to the close of the contest and worked a total of 964,226 man-hours without an accident.

The trophy was accepted by Thomas G. Henderson, superintendent of the mill, who was manifestly proud and expressed the pleasure which he knew would be obtained when the award was presented to the employees of the mill.

Paper Machine Hazards

A round table discussion of paper mill machine room hazards filled the period of the final session on Thursday afternoon, under the leadership of General Chairman George J. Adams. For systematic consideration, the discussion was taken up in the follow order: (1) changing wire; (2) wet felts; (3) dryer section; (4) calender stacks; (5) reels—stacked and drum types; (6) winders—slitters, inrunning nip, and use of rope.

While it was hoped there would be a better representation of machine tenders present to enter into the practical phases of the discussion, there were many ideas presented in the form of safe practices and effective guards and safety devices, which made this part of the program a very interesting one.

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◆ Lagerloef Discontinues Finnish Representation

The Lagerloef Trading Company, Inc., New York City, has announced that, effective December 1, 1937, it will discontinue to be the American representative of the Finnish Cellulose Association and commencing February 1, 1938 it will cease to represent the Finnish Wood Pulp Union in this country. It is the intention and aim of the Lagerloef Trading Company, Inc., to continue its efforts in the field of pulp distribution in the United States, as heretofore, under the guidance of Hans Lagerloef, president.

Unexpired contractual commitments of the Finnish Cellulose Association will be carried out by the newly organized Pulp Sales Corporation, with offices in New York City, which will be the sole representative for the United States and Mexico of the Finnish Cellulose Assn.

◆ E. S. BOSTON has been appointed district sales manager of the Patterson Foundry and Machine Company of East Liverpool, Ohio, with headquarters at St. Louis, Mo., and will have charge of the territory adjacent to St. Louis.

Reorganization Revives Activities of Bird Club, Inc.

EDGAR M. GROUT
Personnel Department
Bird & Son, inc.

These Irish Colleens received hearty applause for their dance in the Minstrel Show

"YOU are now a member of the Bird & Son, inc., family. You have told us about your personal history. We want now to tell you about ours. A mutual acquaintance of this sort is of advantage to us both."

Thus reads one of the opening paragraphs of the new Information Book of Bird and Son, inc., and it is truly upon the words "mutual acquaintance" that the employer-employee relationship at Bird and Son is built. The basic principle which has guided the management from the very beginning has been that the company is made up of *men* and *women* and the continued observance of this principle has caused the business to be conducted in a manner fair to those who work within the organization.

One of the most important factors in maintaining co-operation between the employer and the employee is the matter of recreation, hence, one of the most important organizations at Bird and Son is the Bird Club, Inc. This club has been in existence for more than a dozen years, first as a club for men only, but lately re-organized to include the entire organization. Dues are $1.00 a year and Bird and Son contributes dollar for dollar, thus doubling the annual income. The Bird Club Council budgets this money and assigns a portion of it to each activity. The Council then names a chairman for each activity and he, in turn, appoints his own committee members. Together they work out a program for the year which is submitted to the Council for final approval.

No activity is carried on unless it is actually desired by the club members. Bird and Son lends financial support and stands ready to help in any way possible in the carrying out of the program, but no matter whether it be baseball, tennis, bowling, a dance or a minstrel show, the original suggestion for the activity comes from the aggregate membership and all the work entailed is done by the members of the club.

The club has had an interesting revival in the past two years. Formerly the dues were much higher and the activities limited very largely, to a series of

Bird Club Bowling League Banquet, Wightman's Banquet Hall, May 7, 1936

Members of the cast of the Musical Comedy which was part of the Minstrel Show

eight or nine elaborate and expensive banquets and entertainments with outside talent. With the coming of talking picures and the radio, this old form of entertainment ceased to attract. During the depression, no one had extra money to spend on club dues and it was necessary to first, reduce the dues and finally, to eliminate the dues and suspend the social events temporarily.

In the summer of 1935, it was suggested that the club be re-organized as an athletic and social club and that the membership privileges be extended to the women. From the very first the idea proved popular and the club has grown in membership from less than four hundred to over nine hundred members.

In the summer, there is a wide range of athletic activities such as baseball, tennis, golf, soccer, horseshoes and soft ball, and in the winter the sports include bowling and ping pong, while the social activities include cribbage parties, bridge parties, the Men's Glee Club recital and the Minstrel Show.

The Glee Club is one of the newest activities and is rapidly proving to be one of the most popular. It was organized last winter at the suggestion of two or three members and with some doubt as to its future. Fortunately, the right type of director was engaged and under his leadership a group of seventy men were taught how to sing and enjoy the process. They met once a week all winter long and early in April presented an excellent concert to an enthusiastic audience.

For a number of years, the Bird Club has been equally successful in conducting a number of educational classes with free instruction or instruction at a very low figure with the club paying for part of the course. During the winter of 1936-37, courses were offered in eight different subjects ranging all the way from "personal problems and work efficiency" and Ediphone instruction, to gardening, French, class in knitting for the girls, and first aid.

One of the most popular of the Bird Club's social activities, if not the most popular, is the Minstrel Show. Last May, for the second time in as many years, the club staged this sort of a production as a climax to all activities carried on by the club during the year. More than one hundred employees took part, not only in performing in the show itself, but serving on all the necessary committees such as scenery and properties, checking and ushering.

The popularity of the show necessitated its being run on two successive nights to capacity houses of over nine hundred each night. The entire production was managed by the employees themselves under the direction of the Bird Club Entertainment Committee.

The committee engaged a professional director who came to the plant and directed rehearsals for six weeks prior to the performance. The group which reported twice, and sometimes three times, a week for rehearsals included men and women from every section of the office and plants. Those who worked backstage or on other committees made up equally cosmopolitan groups. Flooring plant workers and paper mill receiving clerks built scenery and moved furniture; roofing shippers danced Irish jigs with stenographers; in fact, everybody from office boys to executives "signed up" and worked together for the success of the show. As for the audience, not only Bird and Son workers but the whole community wanted to attend.

Enthusiastic comments after the show both years, gave proof that everybody had done a fine job and had staged a show worth seeing, but equally gratifying to those who took part, was the pleasure of meeting other Bird and Son workers from other corners of the plant and making real friendships while working together in the show.

During this summer, the Bird Club combined with the Bird & Son, inc. Employees Mutual Benefit Association and Bird & Son, inc., in running a big Field Day program for every Bird and Son worker and his family. This program was held on August 21 at the Francis William Park and Athletic Field in East Walpole with five or six thousand people present.

Baseball, soccer, a tug-o-war, and a fire brigade hose-laying contest were included in the afternoon's festivities with special sports events, a doll carriage parade, a pet show and a magical show for the children. The evening program included a band concert and an elaborate display of fireworks.

An effective dance number, "Waiting at the Gate for Katie," was presented by this group

First Aid Instruction

As can be seen from this account, the Bird Club has definitely succeeded and at least part of the success can be attributed to the fact that it is really an employees club, carrying ou the desires of its employee members, not what some well-meaning representative of management *thinks* the workers want. The club is approved by Bird and Son and gives financial assistance, but the activities and policies of the club are controlled entirely by the members themselves.

Working on the old theory that people enjoy much more, those things for which they work and plan themselves, the Bird Club is entering the 1937-38 season with a record-breaking total membership of individuals who are enthusiastically working for one or two, or more, of its many activities. These people are getting something out of the club, because they are putting something in. That kind of organization has always succeeded.

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◆ Harry A. Legge Made Managing Director

Harry A. Legge has been appointed the successor of the late Howell H. Howard and is now managing director of the Howard Paper Company, Urbana, Ohio; Maxwell Paper Company, Franklin, Ohio; Aetna Paper Company, Dayton, Ohio, and the Dayton Envelope Company, Dayton, Ohio. Mr. Legge's appointment was announced by Maxwell Howard, president.

◆ ACCORDING TO A press report, the Champion Paper and Fiber Company, Pasadena, Texas, has awarded a contract for a recovery unit which will be installed about January 15 and which will cost about $800,000. The Babcock & Wilcox Company, New York, has been awarded the contract, the report stated.

◆ EDWARD H. HALL, a former treasurer of the American Writing Paper Corporation, passed away recently in Springfield, Mass., at the age of 75. Mr. Hall spent many years in the paper industry and served in many capacities in the company of which he later became treasurer.

◆ Percy C. Brooks

Percy C. Brooks, former vice-president of Fairbanks, Morse and Company, passed away October 15 at his home in Chicago, after a lingering illness of about a year. He was 65 years old.

Mr. Brooks began his business career with the Atlanta Machine Works, following his graduation from the Georgia School of Technology in 1891. In 1898 he began nearly 40 years' association with Fairbanks, Morse and Company, as assistant to the general manager at Beloit, Wis. When the Canadian Fairbanks Morse was organized and a large factory built at Toronto in 1905, Mr. Brooks was appointed general manager. Four years later he was made vice-president of the Canadian enterprise.

When the war broke out in 1914, Mr. Brooks converted the Canadian factory into a munitions works for the British Government and as a result of his work in building up a thorough and skilled wartime organization, was rewarded by a visit and compliments from British Royalty.

After the war Mr. Brooks was transferred to St. Johnsbury, Vt., as vice-president and general manager of E. & T. Fairbanks Company, later becoming president. In 1930 Mr. Brooks became an executive vice-president in Chicago, a position he relinquished a few months before his death.

◆ John M. Allen

John M. Allen, assistant sales manager of the specialties division of the International Paper Company, passed away recently at Pewaukee, Wisconsin.

Mr. Allen joined the United States Army in 1916 and saw two years of active service with the Thirty-Second Division. His distinguished service overseas and his valor in action won him the Croix-de-Guerre. He was a member of the American Legion. He is survived by his widow, a son and a daughter.

◆ Northern Paper Mills Sells Power Plants

The Northern Paper Mills Company, Green Bay, Wis., has entered into an agreement with the Wisconsin-Michigan Power Company to sell two hydroelectric power plants on the Menominee River, it was learned recently. The plants, located about 80 miles north of Green Bay, will supplement existing power facilities of the Wisconsin-Michigan utility in the Appleton vicinity. Negotiations for the purchases of the plants by the power company have been under way since the expiration of the lease, May 14, it is understood.

A further announcement indicated that the Northern Paper Mills, will construct a new high-pressure steam electric generating plant. In the meantime the Northern mill will buy current from the Wisconsin Public Service Corporation, a Green Bay private utility, under an agreement with that company and the Wisconsin-Michigan company.

◆ David C. Beck

David C. Beck, Vancouver international representative of the International Brotherhood of Pulp, Sulphite and Paper Mill Workers, was fatally injured October 5, in an automobile accident near Salem, Ore. Three other members of the party, Mrs. Beck and Mr. and Mrs. John Sherman, were seriously injured. Mr. Sherman is vice-president of the brotherhood.

Mr. Beck was 44 years of age and was well known for his efforts in the cause of labor organization. He had represented labor at the legislature at Olympia, Wash., and was a member of the executive board of the Pacific Coast Pulp and Paper Mill Employees' Association.

In addition to his widow, Mr. Beck is survived by a son and three daughters.

◆ Ernest W. Bush

Ernest W. Bush, superintendent of the Provencial Paper Mills of Thorold, Canada, and former paper mill executive in Holyoke, Mass., passed away recently in Thorold. In addition to his position in the paper mills, he was a past president of the Canadian division of the American Pulp and Paper Mill Superintendents' Association.

Mr. Bush served as production manager of the Chemical Paper Company and at various times was superintendent of the Crocker-McElwain Company and the Crocker division of the American Writing Paper Corporation. He is survived by his widow and two sons.

◆ Lyman M. Smith

Lyman M. Smith, general manager of the Inland Empire Company, Millwood, Wash., and a well-known figure in the paper industry, passed away suddenly at his home in Spokane. His death came as a distinct shock to the wide circle of friends Mr. Smith had acquired during his long association with the paper manufacturing business. Besides his widow, Mr. Smith is survived by his mother and a brother.

◆ Ernest Eichsteadt

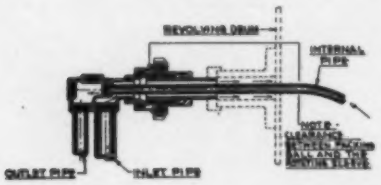
Ernest Eichsteadt, a pioneer Wisconsin settler and senior employee of the Nekoosa-Edwards Paper Company of Port Edwards, Wis., passed away recently at the age of 77. His last position with Nepco was in the capacity of superintendent of mill homes. Mr. Eichsteadt was well known throughout paper trade circles in the middle west.

◆ Great Northern Company to Construct Power Plant

A $2,000,000 power plant is to be constructed by the Great Northern Paper Company on the Penobscot River, Maine, about 3½ miles north of Mattawaumkeag, it was reported lately. Actual construction of this important hydroelectric project will start next spring. The power will be used by the company itself and will be transported to the Millinocket and East Millinocket newsprint plants by high-tension transmission lines.

◆ Revolving Flexible Joint

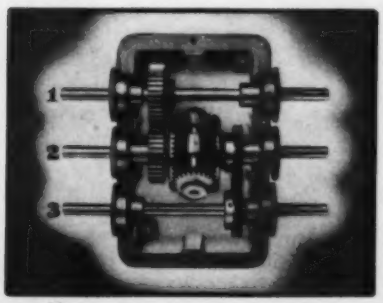
Barco Manufacturing Co., 1801-15 Winnemac Ave., Chicago, has announced the development of a revolving flexible joint which is stated to give fluid tight flexibility in all directions between a stationary and a revolving member. Revolving and sliding movement of the joint, known as Barco 7R-8CR, is taken



care of by a rotating sleeve which is attached to the rotating member; while flexing and alignment movement is taken care of by two spring seated balls which have no part in the rotating movement. Where desired, both inlet and outlet are arranged through one opening or one joint through the use of a universal adapter.

◆ Speed Differential

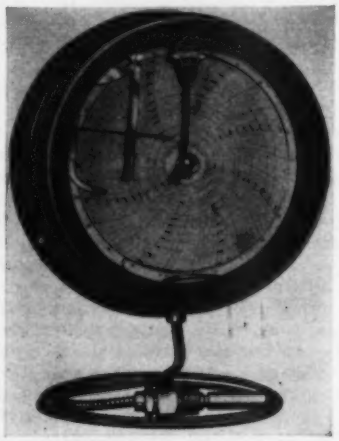
Reeves Pulley Co., Columbus, Ind., has developed a new differential as a supplement to its line of accessory equipment for use with the Reeves Variable Speed Transmission. In this differential, three parallel shafts are mounted within a unit housing and operate in a bath of oil. Gears of 1:1 (stock) ratio drive between shaft 1 and the differential gearing. Between shaft 3 and the differential gearing is a 1:1 chain drive. (Special ratios also are available.) The differential may be used for automatic control service or as primary driving equipment. If for automatic control service, shafts 1 and 3 are connected to the driven machine or machines; and shaft 2 is connected to the speed changing screw of the Reeves Transmission. When shafts 1 and 3 are driven in the same direction at the same speed, shaft 2 stands still. When the speed of the driven machine varies above or below the desired speed, the variation is transmitted to shaft 2 which speeds up



or slows down the Transmission until synchronous speed is restored. An infinite range of speed variation is possible by connecting shafts 1 and 3 to the constant and variable speed shafts, respectively, of the Transmission. By turning the speed control handwheel on the Transmission, shaft 2 may be adjusted to any speed from zero upward within the range of the drive. Overall dimensions of the unit are 8 in. wide, 11 in. long, and 6⅝ in. high. Shafts are extended on both sides so installation may be made as desired.

◆ Modernized Thermometers

A modernized line of indicating and recording thermometers, incorporating improvements in design, construction and operating characteristics, has been announced by The Foxboro Company, Foxboro, Mass. These instruments, known as Mono-therm thermometers, employ an improved thermal system which provides a complete, permanent seal for the actuating medium. The entire system is either welded or braised in such a way that it becomes an integral piece of metal. This construction is being applied to Foxboro thermometers of the vapor-pressure, gas-filled and liquid-filled types. A wider



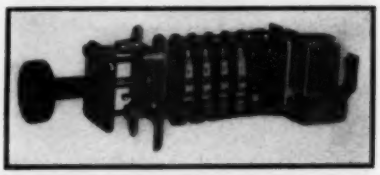
Bourdon spring and a larger, stronger movement give the vapor-pressure indicating thermometer greater durability and ruggedness. The gas-filled recording thermometer also employs a new wide spring which adds to its power. The vapor-pressure type instrument can be protected for a 100 per cent overrange to the breakdown point of the actuating medium; the gas-filled instrument against an overrange of 100 per cent up to a maximum of 1000 deg. Fahr.; and the liquid-filled instrument against an overrange up to a maximum of 500 deg. Fahr.

◆ Auxiliary Relay

A new high-speed, hand-reset, multi-contact auxiliary relay for switchboard mounting, designated as Type HEA, has been brought out by the General Electric Company, Schenectady, N. Y., to supersede the previous type PB-58 multi-contact. The principal parts of the HEA relay are a Type SB-1 switch equipped with three torsion springs which throw the contacts to the "operated" position when the trip coil is released. A small capacitor under the coil reduces arcing of the coil current contacts of 125 and 250 volt relays. Contacts are silver-to-silver and will carry 20 amperes continuously or 250 amperes for 3 seconds.

Only the resetting handle and a small escutcheon are visible on the front of the panel. A white arrow on the resetting handle indicates the position of the contacts.

Operating within 20 milliseconds (1¼ cycles), this relay is applicable particu-



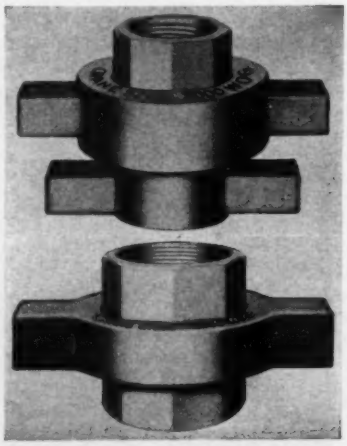
larly where a number of operations are to be performed simultaneously. Among the operations which may be performed simultaneously by the use of this relay are: tripping the main circuit breaker of the circuit, tripping an auxiliary breaker, opening a neutral breaker, sounding an alarm, and operating other relays which in turn perform various functions.

◆ Triple Drain Channel Roofing

A new roofing product in which there are four ridges and three valleys in each channel unit and which is designated as Republic Perfected Triple Drain Channel Roofing has been developed by Republic Steel Corporation, Cleveland, Ohio. The roofing is available in steel, copper bearing steel, and rust resisting Toncan Iron. It is furnished in 26, 28 or 29 gauge and in lengths ranging from 5 to 12 ft. with a covering width of 24 in. A beaded channel makes a tight fit at the overlapping edge; while the proper area for nailing is indicated by blue lines on each sheet.

◆ Hammer Lug Unions

Two distinct lines of hammer lug unions have been added to the family of products of Crane Co., 836 South Michigan Ave., Chicago, Ill. One line includes screwed unions with one set of lugs; while

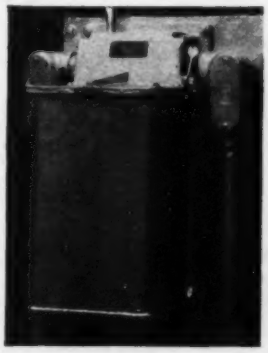


the other includes screwed unions with two sets of lugs. Both lines have been designed for use in piping systems which require frequent or quick dismantling, or for emergency purposes. In either case, a blow with a hammer upon the lug or

lugs will break the joint immediately without the use of a wrench. The single lug union is made in 2, 2½, 3 and 4 in. sizes. In all but the 4 in. size, tailpieces and thread pieces are of forged steel. These parts in the 4 in. size are of cast steel. The double lug union, made in ⅜, ½, and ¾ in. sizes and having lugs on both the union ring and the thread piece, is of forged steel.

◆ Oil-Immersed Low Voltage Linestarter

Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., has announced the development of a totally oil-immersed, low voltage linestarter for starting squirrel-cage motors in applications where either corrosive or explosive gases may be present. The starter, known as low voltage type DNO, provides, in one oil tank, complete corrosion-resisting motor control, motor disconnect switch and circuit protective device. It is of weather-proof, drip-proof, splash-proof, and dust tight construction with cast iron top and sheet steel tank with gasketed joint, and is designed for either wall or frame mounting. Overload protection is provided by two thermal induction oil-immersed automatic reset



overload relays; while low voltage protection is obtained with three-wire push button control. Interlocking of breaker handle with tank assures complete safety. A combination unit with non-automatic disconnect switch and a plain starter without disconnect also is available.

◆ Surface Protectors for Metal

The Harrington Paint Co., Inc., 1630 Collamer Ave., East Cleveland, Ohio, has developed two new products for the protection of metal surfaces.

One product, known as Galvide, is stated to give perfect adhesion to galvanized metal without any acid etching or special processing of the metal before application. The same material also is said to provide protection from the attack of inorganic acids and alkalies.

The other product, Rust-eeter No. 100, is a rust conversion primer. This primer, according to the manufacturer, will give absolute protection against further oxidation and does not require the surface to which it is applied to be clean of rust. It also is stated to provide protection against the attack of inorganic acids and alkalies.

◆ Constant Level Oiler

Trico Fuse Mfg. Co., Milwaukee, Wis., has announced a constant level oiler for automatically maintaining an accurate level of oil in ring and ball bearings of motors, line shafts, pumps, and other machinery having oil wells. The oiler, made in four sizes and known as Levomatic, consists of a crystal clear glass reservoir and a solid bronze cadmium-plated fitting to which it is screwed. The design permits easy removal of the reservoir from the fitting for oil re-filling.

◆ Zinc Coated Galvanized Sheet

The American Rolling Mill Company, Middletown, Ohio, has developed a galvanized sheet which is coated with a heavy coating of commercially pure zinc, and which, it is stated, will not crack or peel when subjected to relatively severe drawing or forming operations. The material, known as Zincgrip, is made available in any of the basic grades of galvanized iron or steel sheets and strip manufactured by the company in from 16 to 28 gauge. It is suggested for many kinds of fabricated products where resistance to corrosion is desirable.

◆ New Wetting Agent

A new wetting agent, trade-marked "Tergitol," has been announced by Dr. B. G. Wilkes of Mellon Institute, Pittsburgh, Pa., and Dr. J. N. Wichert of Carbide and Carbon Corporation, South Charleston, West Virginia. A tenth of an ounce of "Tergitol," when added to a gallon of water, is stated to condition the water so that it wets what it touches almost instantly. Likewise, "Tergitol" is said to be very effective and quite stable under most commercial concentrations of alkaline, acid, oxidizing and hard water conditions as frequently met in paper-making processes; and to be well suited for the impregnation of paper where it is desired to impart future absorbency. It also has been found to serve as an emulsifying agent and to aid in the dispersion of lime soaps, in the latter case, reducing the tendency of soaps to form curds in hard water.

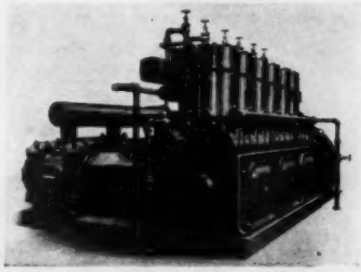
◆ Electric Hammer and Drill Tool Retainer

A molded rubber tool retainer has been developed by the Wodack Electric Tool Corporation, 4627 West Huron Street,

Chicago, Ill. This retainer fits over the nose of a Wodack electric hammer and holds the cutting tool in place with suitable play for rapid drilling or cutting. It also keeps grit from getting into the socket in overhead drilling.

◆ Four-Cycle Angle-Type Gas Engine Compressors

Worthington Pump and Machinery Corporation, Harrison, N. J., has developed a line of four-cycle angle-type gas engine compressors. These compressors, known as Type LCE units, are built with one to four compressor cylinders, corresponding to 75 to 300 hp. All compressor cylinders are horizontal and at right angles to the power cylinders. Each compressor cylinder has two corresponding power cylinders and the compressor element can be arranged to deliver any combination of volume and pressure within the limits of the engine rating. The engines are of a vertical, four-cycle type and are provided with large water jackets with clean-



out plates. Engine and compressor connecting rods are identical and interchangeable, forced feed lubrication is used throughout, and all running gear is totally enclosed.

◆ Vacuum Filter Developments

Four vacuum filter developments have been announced by Oliver United Filters, Inc., 33 West 42d Street, New York. One of these developments is a two-way valve for deckers or save-alls; another pertains to the deckering of tailings; a third relates to the use of a short barometric leg on a decker or washer; and the fourth to counter-current brown stock washing with an Oliver-Young filter. The two-way valve for deckers or save-alls has a clear and a cloudy port which permits re-use of clear filtrate in machine showers, one groundwood decker installation, citing an example, delivering 60 per cent of the filtrate as clarified white water to the paper machine. Application of the Oliver patented vacuum discharger made possible the deckering of refined sulphite and groundwood screen rejects. A high vacuum in each section of an Oliver-Young decker or washer permits the use of a short barometric leg, which in turn allows the filter to be located directly adjacent to the cross flow box at the end of flat screens, thus eliminating the necessity of elevating the decker to a height sufficient for a long barometric leg. With the Oliver-Young filter as a brown stock washer, the diluted liquor is carried forward, building up density at each stage, and wash water, only a little of it, is added at the last stage, the washing proceeding counter-currently and the filter drum acting as a receiver and in which the air drawn in with the wash liquor is quickly separated from it. This procedure is believed by Oliver engineers to have solved the problem of foaming.

◆ New Catalogues and Publications

American District Steam Co., North Tonawanda, N. Y.—A loose-leaf bulletin (No. 35-76), which has to do with this company's copper U-tube water heater, has been issued recently. The bulletin describes water heaters of the instantaneous or gravity recirculating type, submerged heater type, condensate cooler type and the type F gravity recirculating type for use in protecting exposed storage tanks.

Bagley and Sewall Co., Watertown, N. Y.—A series of splendid photographs, showing in some detail, the design and construction of a speciality machine built for the Smith Paper Inc., Lee, Mass., by this company, is the latest bulletin offering of the firm. Besides a brief statement at the beginning of the publication and a few words at the end, this bulletin is devoid of any written material; the photographs, in this case, being quite able to speak for themselves.

Black-Clawson Co., Hamilton, Ohio—This bulletin, No. 114-B of *The Paper Industry Speaks* series, deals with uniform pressure doctors manufactured by the firm. Written material, describing the product itself along with the installation and adjustment of same, photographs and diagrams serve to give the reader a clear idea of the structure and workings of the doctor.

Consolidated Metals Corp., Detroit, Mich.—Types and specifications of bearing metals, solders and cored and solid bars are described in a new bulletin issued lately by this firm.

Continental-Diamond Fibre Co., Newark, Del.—Micabond, a bonded mica insulating material, is completely described in a new publication released recently by this firm. Using photographs to good advantage, the bulletin covers such points as the manufacture of plate micabond, uses of micabond, diaelectric properties, sizes and specifications of micabond plate, micabond tape, micabond tubing, micabond segments and micabond "V" rings.

DeLaval Steam Turbine Co., Trenton, N. J.—Two new brochures, both of which contain many illustrations, have been issued recently by this firm. Recent developments in higher steam pressures and temperatures, in boilers and combustion equipment, in steam turbines and in the application of exhaust and bled steam is the theme of one of the bulletins, No. E-1169. The other publication, L-32-10, deals with the varied uses of the "IMO" rotary oil pump. The applications shown in the presentation range from small lubricating pumps built into other machines, to pumps supplying oil to hydraulic pressure systems at 500 lb. per square inch.

E. C. Fuller Co., Chicago, Ill.—Testimonials and a description of eight features of National Cutters are contained in a recent bulletin issued by this company. Also included in the bulletin is a return card by which interested parties may ascertain prices of the product,

B. F. Goodrich Co., Akron, Ohio—A new, thirty-page *Industrial Tire Handbook* has just been published by this firm. The book points out ways to lower costs and speed up plant operation by using proper rubber-tired wheels on material handling equipment. Specification tables and photographs are featured throughout the edition.

Hancock Valve Division, Manning, Maxwell & Moore, Inc., Bridgeport, Conn.—A new four-page illustrated bulletin describing the new Duravalve manufactured by this company has been published recently by the firm. The new valve is described as "leak-proof" and has an integral Stellite seat flowed on by welding so that the seat and body are one piece.

Heil and Company, Cleveland, Ohio—A new folder, dealing with methods of heating corrosive liquids used in the various process industries, has just been published by this company. In addition to the information on the firm's steam, gas and electric tank-heating equipment, the bulletin presents diagrams of pipework connection details, graphs of heating speeds and other useful data.

Jeffery Manufacturing Co., Columbus, Ohio—The theme of this bulletin (No. 679) has to do with pulpwood preparation equipment. The bulletin itself is amply illustrated and presents by use of written material and photographs the company's bark shredders, re-chippers, salt cake crushers, screenings grinders in addition to the various elevators, conveyors and other pulpwood handling equipment, manufactured by the firm.

Johns-Manville, New York, N. Y.—The new 1937-38 edition of the company's *Industrial Products* catalogue is now available. This 64-page book, profusely illustrated, contains many valuable items which have to do with high and low temperature insulations. Specifications on JM built-up roofs, insulated roofs, corrugated transite, industrial friction materials, and packings and gaskets are included among the many products described. The publication (Form GI-6A) is written in a clear and precise manner and the uses of the products are illustrated in such a way as to be thoroughly understandable.

Linde Air Products Co., New York, N. Y.—An extremely informative booklet entitled *Preventing Welding and Cutting Fires,* has recently been brought out by this firm. The booklet is an important part of the nation-wide program to promote safe practices among the users of industrial equipment and includes safe and sure rules to follow for preventing the possibility of welding or cutting fires, as well as other pertinent information.

Norton Co., Worcester, Mass.—A new 23-page bulletin, explaining the manufacture and uses of the different types of refractories produced by this firm,

has been circulated recently. Photographs, tables and diagrams in addition to extensive reading matter, give the reader a good idea of the properties, manufacture, and varied uses of the products.

Patterson Foundry & Machine Co., East Liverpool, Ohio—A rather unusual and attractive brochure presenting the companys' aluminum typhoon mixer has been released by the firm lately. The various features of the product are illustrated by a number of photographs, in which the lovely Miss Gladys George demonstrates the mixer to good advantage.

Quigley Co., New York, N. Y.—A new bulletin issued by this company explains the uses of Insulbrix, a light-weight insulating fire brick, manufactured by the company. The bulletin (Form INSB-198) sets forth the advantages of the product and includes specifications of same.

Reliance Electric and Engineering Co., Cleveland, Ohio—Two looseleaf bulletins have been released recently by this company. The splash-proof type AA, form P, 2 and 3 phase A-C squirrel-cage motor is described in Bulletin 122 while the explosion-proof, A-C motors, type AA, 2 and 3 phase squirrel-cage motors are described in Bulletin 124. Both publications are illustrated.

Wallace and Tiernan Co., Inc., Newark, N. J.—The elimination of slime is the theme of a mailing piece circulated by this company. The bulletin emphasizes the impaired quality, loss in paper making materials and increased production costs, as a result of slime and explains the use of the company's chlorinators and ammoniators in connection with slime removal.

BOOKS

Device For Testing Haemacytometers and Other Pipettes of Small Capacity—This abstract by Elmer L. Peffer, explains that for many years it was customary practice at the National Bureau of Standards to use a weight method in the test of dilution pipettes, to determine the relative capacities and thence the volume ratios of the intervals tested. Due to the fact that an ever greater number of dilution pipettes have been submitted to the Bureau for test, it was necessary to develop a test method that would be more rapid than the weight method and at the same time sufficiently accurate for the purpose. The apparatus thus developed, is described in this Research Paper RP1019, U. S. Department of Commerce, National Bureau of Standards. The paper is obtainable from the Superintendent of Documents, Washington, D. C., for five cents.

Temperature and Hysteresis Errors in Calomel Half-Cells—This pamphlet by Baker Wingfield and S. F. Acree, states that calomel reference half-cells are used extensively in both electrometrictitrations and pH work. The purpose of this report is to emphasize the errors which may be introduced into pH measurements by temperature changes affecting the potential of calomel half-cells. The pamphlet, Research Paper RP1018, U. S. Department of Commerce, National Bureau of Standards, may be obtained from the Superintendent of Documents, Washington, D. C., for five cents.

Rulings and Interpretations under the Walsh-Healey Public Contracts Act—This document represents an analysis of Public Act. No. 846, Seventy-fourth Congress, of the regulations of the Secretary of Labor, issued pursuant thereto and of the opinions of the Comptroller General on that Act, as well as a collection of the major rulings and interpretations adopted under the Act. The document covers such point of the Act as contracts, employees, wages, hours, deductions and rebates, child labor, safety and health, posting records and reports, advertisement and bids, enforcements methods, exceptions and exemptions. The pamphlet is obtainable from the Superintendent of Documents, Washington, D. C., for ten cents.

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CYLINDRICAL ROLLER ROLLWAY BEARINGS

◆ IPI Announces Second Annual Essay Contest

A second annual IPI essay contest on color, with more prizes and wider coverage, is being sponsored by the International Printing Ink Corporation in cooperation with the National Graphic Arts Education Guild.

While the first contest was open only to high school sophomores, juniors and seniors, this 1937 competition will include ninth grade junior high school students and high school freshmen. To compete, students must be enrolled in a printing course and must submit essays not longer than 400 words on "The Future of Color in Printing."

National prizes will go to two separate groups. In fairness to the younger students, freshmen (including junior high ninth graders) and sophomores will be segregated into one group, while juniors and seniors will be in another division. First prize for the junior-senior group will be a university scholarship. A trip to New York City, including visits to the largest metropolitan printing plants, the IPI Research Laboratories and other points of interest will go to the second prize winner. In the freshman-sophomore division, a trip to New York will be first prize. Second prize will be a $50 job printing press. Four local prizes will be awarded (two in each group) for the best papers submitted at each school entered in the contest.

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1—300 KW G. E. modern MG set, 250 volts DC 2300/3/60, 35% leading P.F. with switchs.
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1—10 ton Milwaukee Gasoline Locomotive, 40" or 42" ga. Thoroughly reconditioned.
1—6 ton, same as the above.
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◆ Packaging Exposition Returns to Chicago

The Eighth Packaging Exposition will be held at the Palmer House, Chicago, March 22-25, inclusive, 1938, it is announced by Alvin E. Dodd, president of the American Management Association, sponsoring organization of the exposition.

Some 75 leading firms throughout the country will present in the exposition the latest developments in the machinery, equipment, supplies and services vital to the packaging, packing, physical distribution and merchandising of a considerable proportion of the nation's commodities and goods.

Concurrently with the exposition, which has been presented annually since 1931, the American Management Association will hold its Eighth Conference on Packaging, Packing and Shipping. Leading national authorities will discuss outstanding problems and developments in these fields.

A notable feature of the exposition, it was stated by Mr. Dodd, will be an exhibition of all entries in competition for the Seventh Irwin D. Wolf Awards, the nation's highest honors for outstanding accomplishment in the merchandising and technical phases of packaging.

The exposition returns to Chicago for the first time since 1935, the showings of 1936 and 1937 having been held in New York City. Holding of the exposition in Chicago, it was pointed out by Mr. Dodd, reflects not only the national scope of the exposition but also a recognition of the increasing importance of the mid-western market for the equipment, machinery and services which the exposition so dramatically presents.

The annual packaging expositions were inaugurated under the sponsorship of the American Management Association. The association is a non-profit federation of industrial and commercial corporations and executives who are interested in business "both as a profitable enterprise and as a profession." Its members, drawn from all types of industry, exchange information, compare methods and check results through conferences, publications and personal consultation. The association's sole concern is with "the practical aspects of business technique."

The Eighth Packaging Exposition will be under the management of Clapp & Poliak, Inc., 232 Madison Avenue, New York City, which organization has managed all previous expositions.

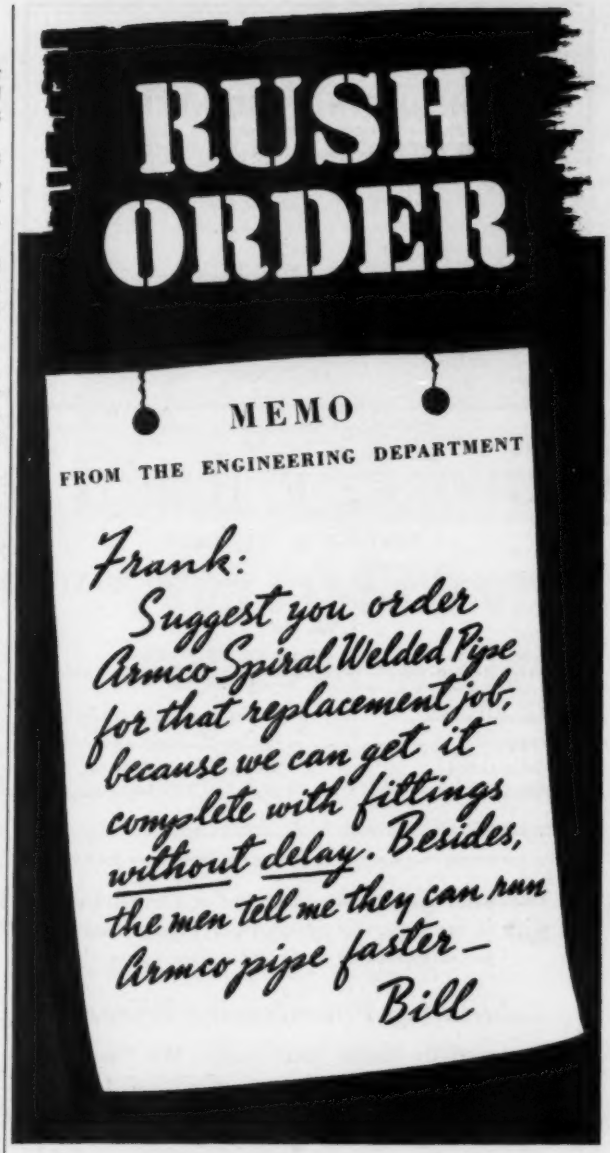
◆ International Acetylene Association Awards Morehead Medal

The James Turner Morehead Medal for the year 1936 has been awarded to Mr. H. Sidney Smith for his vision, inspirational guidance and aggressive cooperation in the advancement of the acetylene industry. The medal will be presented to Mr. Smith during the opening session of the 38th Annual Convention of the International Acetylene Association to be held at Tutwiler Hotel in Birmingham, November 10.

The Morehead medal is awarded annually by the International Acetylene Association to the person or persons who in the judgment of its Officers and Board of Directors have done most to advance the industry or the art of producing or utilizing calcium carbide or its derivatives. The award was established in 1922 by the Honorable John Motley Morehead in honor of his father, the late James Turner Morehead, who in 1892 sponsored the experiments which led to the discovery of the electric furnace method of producing calcium carbide.

Past recipients of the Morehead Medal have included other such outstanding men in the acetylene industry as Edmond Fouche, the late Samuel Wylie Miller, the late Reverend Julius Arthur Nieuwland, and Dr. David Schenck Jacobus.

Mr. Smith has also recently been announced as the recipient of the Samuel Wylie Miller Medal awarded by the American Welding Society and thus becomes the first to receive the two outstanding awards of the welding industry. He is a well-known figure in the acetylene industry both in America and abroad. He has served as president of both the British Acetylene Association and the International Acetylene Association, and he has been directly responsible for many important developments in acetylene utilization.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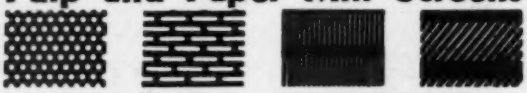

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◆ Chicago Power Show Closes Successful Session

The Chicago Exposition of Power and Mechanical Engineering, held at the International Amphitheatre, Chicago, October 4 to 9, was one of the most successful events of its kind ever held in the Mid-West, according to all reports.

The total attendance for the week was 26,142, representing executives, departmental heads, industrial buyers, plant engineers and operators, mechanics and maintenance men from all over the middle west and many other sections of the country. One hundred and fifty-three exhibitors co-operated to present an exposition characterized by dynamic displays featuring equipment in operation.

The displays were so arranged that points of construction and operation could be easily grasped and appreciated by the observer. Steam traps, equipped with glass bodies revealed their operating function—cut-away sections of piping joints were on display—pulleys and gears turned—tools, welding machinery, bearings, drives, were shown in operation. Diesel engines were represented by an exhibit called the "parade of power" and few visitors missed the 160-horsepower unit that was featured. Steam specialties were given a great deal of attention as were precision machine tools, open-end band saws and materials handling equipment.

The exposition was under the management of the International Exposition Company, producers of the National Power Shows in New York. Charles F. Roth is manager.

STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC., REQUIRED BY THE ACT OF CONGRESS OF MARCH 3, 1933

Of The Paper Industry, published monthly at Chicago, Illinois, for October 1, 1937:

State of Illinois, County of Cook, ss.

Before me, a Notary Public in and for the State and county aforesaid, personally appeared Edward B. Fritz, who, having been duly sworn according to law, deposes and says that he is the owner and publisher of "The Paper Industry" and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management (and if a daily paper, the circulation), etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 411, Postal Laws and Regulations, printed on the reverse of this form, to wit:

1. That the names and addresses of the publisher, editor, managing editor, and business managers are: Publisher, Edward B. Fritz, 333 N. Michigan Ave., Chicago, Ill.; Editor, Harry E. Weston, 333 N. Michigan Ave., Chicago, Ill.; Associate Editor, B. Merrithew, 333 N. Michigan Ave., Chicago, Ill.; Business Manager, Edward B. Fritz, 333 N. Michigan Ave., Chicago, Ill.

2. That the owner is: (If owned by a corporation, its name and address must be stated and also immediately thereunder the names and addresses of stockholders owning or holding one per cent or more of total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a firm, company, or other unincorporated concern, its name and address, as well as those of each individual member, must be given.) Edward B. Fritz, 333 N. Michigan Ave., Chicago, Illinois.

3. That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or other securities are: (If there are none, so state.) None.

4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him.

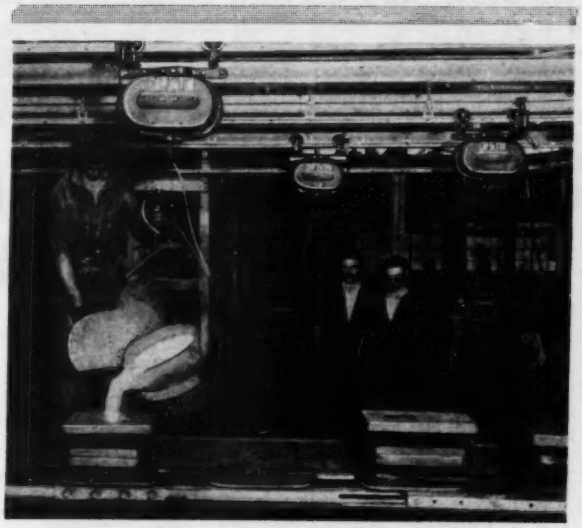
5. That the average number of copies of each issue of this publication sold or distributed, through the mails or otherwise, to paid subscribers during the twelve months preceding the date shown above is ..... (This information is required from daily publications only.)

EDWARD B. FRITZ,

Sworn to and subscribed before me this 21st day of September, 1937.

[SEAL] JANE A. DeWITT.

(My commission expires August 1, 1940.)



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devoted to a planned safety program in your plant will change accident-outgo into divisible dividends... assure a more favorable insurance rate...decrease the "accident-payroll"...and bring lower operating costs.

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The ideals of the great industrial leaders of the past are perpetuated by the adaptation and enforcement of modernized safe practices in industrial management... and, the National Safety Council's emblem of Universal Safety is a self-imposed mark of distinction... signifying a human appreciation of worker-value with mutual profit to employer and employee.

WRITE FOR DETAILS

PAPER & PULP SECTION NATIONAL SAFETY COUNCIL TWENTY NORTH WACKER DRIVE CHICAGO ILL.

The Paper Industry Safety Contest

July 1, 1937 to June 30, 1938

Cumulative Scores as of September 30

33 Mills Have Perfect Record

PERFECT SCORES

Division I—Paper and Pulp Mills

	PARTICIPANT	MILL	LOCATION
A	Consolidated Paper Corp., Ltd.	Wayagamack Div.	Three Rivers, P.Q., Can.
	Container Corp. of America	Philadelphia	Pennsylvania
B	Paterson Parchment Paper Co.	Bristol	Pennsylvania
	Pioneer-Division-Flintkote Co.	Los Angeles	California
C	Strathmore Paper Co.	Woronoco	Massachusetts
	Finch Pruyn & Co., Inc.	Glens Falls	New York
	Cornell Wood Products Co.	Cornell	Wisconsin
	Container Corp. of America	Carthage	Indiana
D	The Harriman Co.	Harriman	Tennessee
	Lawrence Paper Co.	Lawrence	Kansas
	Container Corp. of America	Circleville	Ohio
	Bird & Son, Inc.	Phillipedale	Rhode Island
	Crown Willamette Paper Co.	Lebanon	Oregon
	Union Bag & Paper Corp.	Allen Paper Mill	Hudson Falls, N. Y.
	Spaulding Fibre Co., Inc.	Milton	New Hampshire
	The Mead Corporation	Nashville	Tennessee
	United States Envelope Co.	Morgan Paper Co. Div.	Lititz, Pa.
	Rogers Fibre Co., Inc.	Bar Mills	Maine
	Ponds Extract Co.	Seymour	Connecticut
	Hollingsworth & Whitney Co.	Aroostook & Cobbossee Mills	Gardner, Maine
	International Paper Co.	Riley No. 23	Riley, Maine
	Alton Box Board Co.	Carlyle	Illinois
	Spaulding Fibre Co., Inc.	Hayes Plant	North Rochester, N. H.

Division II

Union Bag & Paper Corp.	Specialty Bag Factory	Hudson Falls, N. Y.
Bird & Son, Inc.	Norwood	Massachusetts
National Container Corp.	Long Island City	New York
Bird & Son, Inc.	Chicago	Illinois
Texas Corrugated Box Co., Inc.	Dallas	Texas
Bemis Bros. Bag Co.	East Pepperell	Massachusetts
Container Corp. of America	Natick	Massachusetts
Fisher Paper Box Co.	Minneapolis	Minnesota
Bird & Son, Inc.	Shreveport	Louisiana
Bay West Paper Company	Green Bay	Wisconsin

IMPERFECT SCORES

	Key Number	Rank	Disabling Injuries	Frequency Rate
GROUP A	P-108	3	1	1.343
	P-130	4	1	1.894
	P- 60	5	1	2.106
	P- 22	6	1	3.192
	P-128	7	1	3.321
	P-121	8	2	4.137
	P- 12	9	3	5.757
	P-102	10	3	6.352
	P- 1	11	6	6.637
	P- 18	12	5	6.995
	P- 28	13	10	7.871
	P- 30	14	3	8.075
	P- 19	15	3	8.167
	P- 10	16	5	8.744
	P-136	17	4	8.868
	P- 84	18	5	9.678
	P- 21	19	5	11.051
	P- 27	20	17	11.476
	P- 11	21	6	12.542
	P- 58	22	4	12.695
	P- 9	23	10	12.902
	P- 23	24	6	14.773
	P- 2	25	6	16.752
	P- 67	26	13	17.607
	P-107	27	6	19.371
	P- 62	28	8	19.607
	P- 73	29	15	19.631
	P- 64	30	11	20.895
	P- 3	31	7	22.584
	P-120	32	10	31.713
	P- 87	33	21	35.027
	P-114	34	24	35.224
	P-140	35	17	36.590
	P- 32	36	16	40.202
	P- 40	37	15	46.015
	P- 71	38	13	52.741
GROUP B	P-112	3	1	3.363
	P- 60	4	1	3.374
	P- 68	5	1	3.399
	P-143	6	1	4.128
	P- 72	7	1	4.258
	P- 4	8	1	4.277
	P-100	9	1	6.585
	P-122	10	2	7.497
	P- 59	11	2	7.729
	P-142	12	2	7.754
	P- 97	13	2	8.412
	P-123	14	3	11.445
	P- 70	15	4	15.859
	P- 46	16	3	16.509
	P-119	17	4	19.219
	P-124	18	5	20.182
	P- 26	19	7	34.502
	P- 25	20	7	24.858
	P- 45	21	6	25.420
	P-137	22	6	25.822
	P- 16	23	7	28.648
	P- 15	24	7	28.955
	P-130	25	11	38.443
	P- 82	26	12	40.327
	P-104	27	14	58.859
GROUP C	P- 55	5	1	5.634
	P-116	6	1	10.216
	P- 43	7	1	12.471
	P- 52	8	2	12.934
	P- 47	9	2	18.048
	P- 88	10	3	18.278
	P- 61	11	3	18.759
	P-103	12	2	19.305
	P-113	13	3	24.682
	P- 17	14	3	25.925
	P- 33	15	4	28.353
	P- 29	16	3	30.499
	P- 94	17	4	35.118
	P- 48	18	4	37.675
	P- 14	19	4	40.067
	P- 41	20	6	53.646
	P-111	21	8	61.418
	P-144	22	12	67.353
	P- 80	23	8	80.236
GROUP D	P- 93	16	1	18.841
	P- 99	17	1	19.996
	P-125	18	1	21.584
	P- 6	19	2	22.657
	P-134	20	2	25.521
	P- 42	21	1	25.688
	P-106	22	2	27.181
	P- 81	23	2	32.029
	P-110	24	1	40.994
	P- 7	25	4	51.151
	P-138	26	4	54.877
	P- 65	27	3	60.656
	P- 63	28	3	61.238
	P- 98	29	4	69.907
	P-131	30	5	97.794

Division II

R-23	11	1	4.047
R-21	12	1	5.250
R- 1	13	1	8.099
R- 5	14	2	8.151
R-27	15	1	9.355
R-19	16	1	10.239
R-18	17	1	12.000
R-13	18	1	13.756
R-10	19	2	18.196
R-24	20	4	25.183
R- 9	21	2	30.498
R-22	22	1	31.630
R-26	23	7	64.329
R- 6	Withdrawn—Reports Missing.		

No September Report—Two months total only: Cornell Wood Products Co., Cornell, Wis.; Container Corp. of America, Carthage, Ind.; Bay West Paper Co., Green Bay, Wis.; P-62; P-40; P-71; P-100; P-43; P-41; P-42; P-63.

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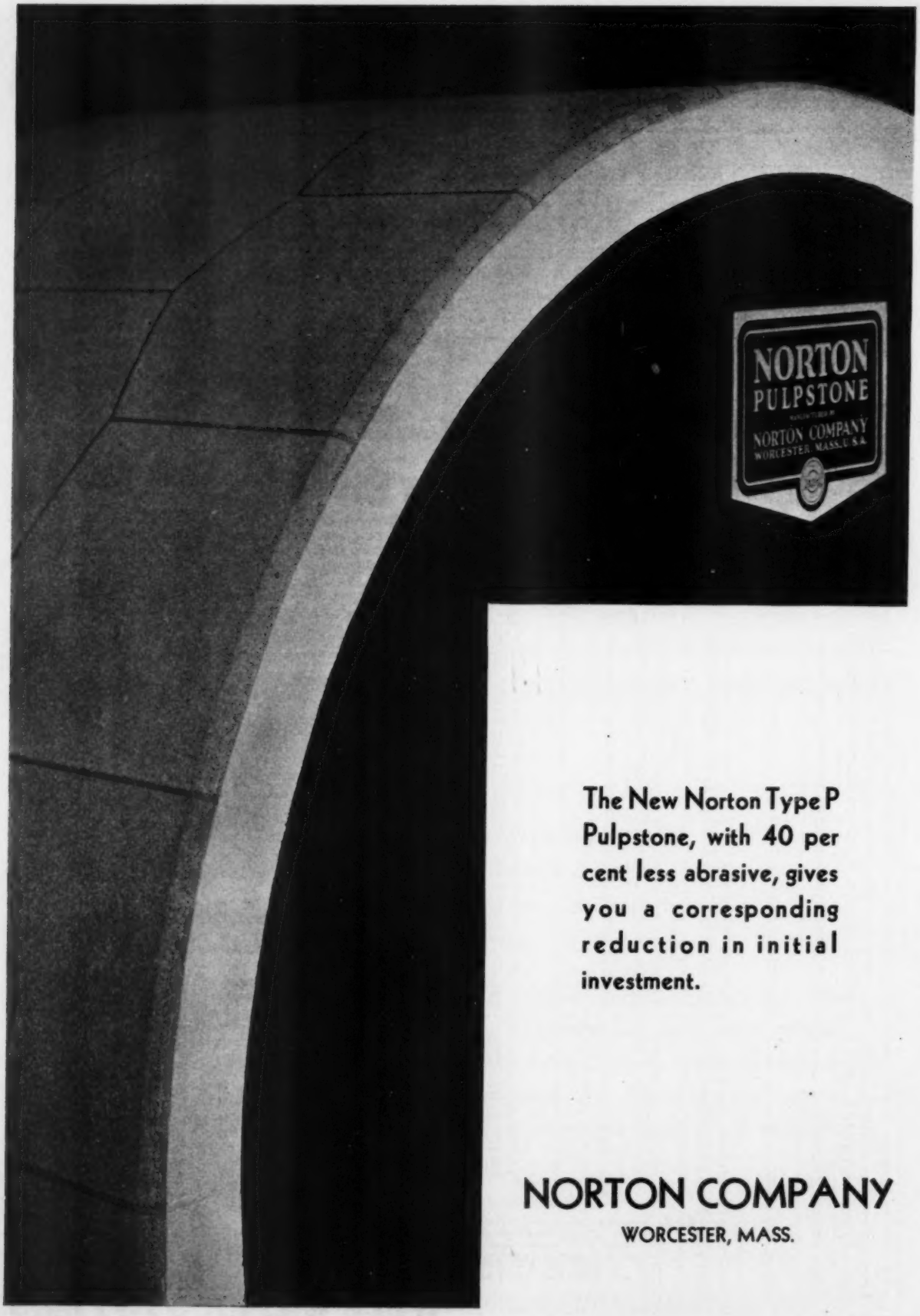

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POWER

GENERATION + UTILIZATION + MAINTENANCE

This section turns the searchlight on power and its allied problems, showing big possibilities to save. Opportunities to improve conditions, methods, apparatus will be discovered. Worthwhile practices suggest new ideas and wider usages of equipment.

By W. S. JOULE

◆ Overcoming Anchor and Frazil Ice Troubles

Frazil ice is ordinarily encountered for only a comparatively short period of time during the early part of the cold season just preceding the formation of permanent surface ice and when there are usually high winds and the surface of the pond is turbulent. Considerable agitation is necessary for the development of this formation, otherwise solid ice would be formed on the surface instead. Such ice does finally form, of course, and when it does frazil ceases to form and what there is of it in the water gradually attaches itself to the under side of the surface ice and forms a kind of inverted dam which is not altogether impervious to flow, but which in a narrow channel such as a canal, may seriously curtail the water supply to the penstocks.

At locations where there is a considerable pond area above the head gates that is fairly well protected from wind, frazil will not cause a great deal of difficulty. Where there are rapids above, which keep the water in a constant turmoil, frazil ice will be formed and will be carried down to the racks.

This formation of ice consists of minute individual crystals which are interspersed throughout the body of the water to a depth of several feet. It has the property of adhering fast to any cold body, at or below a temperature of 32 deg. Fahr., with which it may come in contact. It crystalizes out on head racks where the ends are exposed and will quickly close up the whole opening unless the grid is heated in some way. A temperature of only a fraction of a degree above the freezing point is sufficient to prevent the crystals from attaching themselves to the grating.

Even penstocks, guide vanes, and runners of the turbine form a lodging place for these crystals when the turbine is so installed as to prevent radiation of heat to these parts, as for instance when the whole turbine casing is imbedded in concrete. Once this formation starts, it builds up rapidly and the turbine is forced to shut down. When this happens, the water remaining in the casing, due to the damming effect of the frazil accumulation, quickly solidifies and then it is a matter of hours or a day, possibly, chopping out the ice so that the turbine can be run.

In some installations where such a freeze-up is likelv to occur, the turbine casing is enclosed in an outer casing, leaving a small space between to which steam may be admitted. A simpler method, though perhaps not as immediately effective, is to put two or three coils of pipe around the crown and bottom plates and connect them with a steam supply. Where the turbine casing is directly exposed to the generator room temperature, frazil formations will be found to give little trouble, but it is questionable whether or not this method of keeping the turbine above the freezing point is as economical as it might be.

◆ Packing and Regrinding Valves

Careful attention should be given to packing and it should be inspected frequently. If leaky packing cannot be made tight by a moderate amount of screwing up it should be renewed at once. The need for renewal of packing is not always indicated by leaking, but the position of the packing nut or packing sleeve will often indicate the need of new packing. It is best to follow the advice of the manufacturers in the choice of material for packing.

Choose valves with a generous packing space, especially in the matter of depth, which means a given tightness for less pressure, and with a non-turning gland if possible. Nuts on packing studs should be tightened evenly to avoid binding on the stem. For valves which stand full open much of the time the packless type is widely used.

If service is of such character that regrinding is likely to be necessary "regrinding" valves should be specified. With valves of moderate size, arranged for regrinding, all that is necessary is a little graphite or oil and graphite and brace with screwdriver. In the case of large valves, returning in the lathe or in some cases replacing of disc and seat are necessary.

◆ Working on Live Lines

In the earlier days of high-tension systems, work on live lines was practically limited to 2300 v. or less, and even then many accidents and fatalities resulted; but as the slogan of the operating man became that of continuity of service, every effort has been made to do repair or other work with a minimum amount of interruption to service. The use of rubber gloves was resorted to, but unfortunately these were first used without suitable protective coverings and as a result many fatalities occurred from too much dependence being placed on them. In general, it is not advisable to use rubber gloves under any condition of working without having them provided with a suitable leather or buckskin covering which will protect effectively against any ordinary wear.

A further step has been made in requiring a lineman to wear rubber boots when working on live lines, particularly in wet weather, as many fatalities and accidents have resulted from contact of some other portion of the worker's body with a live conductor even though he was wearing rubber gloves.

Insulating shields, consisting of heavy rubber coverings are being used for protection; but, unfortunately, when working among lines that are rather closely placed they are rather bulky for use. Their use, however, is to be recommended wherever possible.

◆ IN THE REHABILITATION of an old plant considerable missionary work must be done with the operating force. The transition from old to new methods and ideas is necessarily slow and calls for considerable perseverance and nerve on the part of those making the changes. Diplomacy is as necessary as engineering ability, for though direct orders can be given for all phases of operation, the net results of the changes made will not be as great as they would be, if the operating force were in sympathy with the ideas.

◆ Careless Operation Is Costly

Operation is the most vital factor in getting plant economy. Advantages of the latest and most expensive equipment, the most careful planning, co-ordination and installation of a plant may all be nullified by careless operation.

We have all seen plants with crude machinery operated so as to give remarkably good results; also plants with good equipment so managed that the results were a great disappointment.

Adequate records carefully studied, intelligent, systematic routine for operation and inspection, provision for immediate correcting of wasteful conditions, are the essentials of good operation.

Orderly progress in improvement of economy is secured by making certain that present equipment is being operated in the best way; then by replacing inefficient machinery with that which can be shown to pay a profit on its cost, until the whole plant is showing a maximum return per dollar of total expense, including operating cost and overhead.

Facts on CHLORINE DISPERSION*

More than four years ago Pennsylvania Salt Manufacturing Company made available to the paper industry a new and efficient method of introducing elemental chlorine into the bleaching of pulp.

This method involves the production and use of chlorine dispersions in excess of the solubility of chlorine in water, and the feeding of the unbroken dispersion to pulp in multi-stage bleaching.

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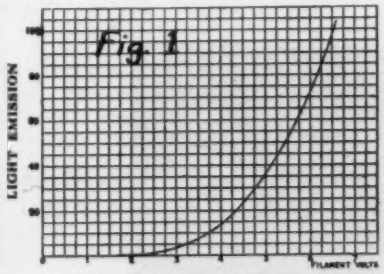
TECHNICAL DEVELOPMENTS IN THE PAPER INDUSTRY

The following abstracts are of the latest developments found in the foreign press.

◆ Photoelectric Measurements of Opacity and Brightness

This is a comprehensive British article which outlines the construction and operation of the following instruments: (1) Cambridge opacity meter; (2) Bureau of standards opacity meter; (3) Zeiss-Pulfrich sphere Reflectometer; (4) Westinghouse Trans-o-meter; (5) Cambridge photoelectric opacity meter; (6) blancometer; (7) Bausch and Lomb opacimeter; (8) Lautenschlaeger Reflection meter; (9) G.E. C Reflection meter; (10) Zeiss Reflection meter. For routine testing objective photoelectric methods eliminate eyestrain and personal errors. However, the cells are far from perfect substitutes for the eye.

The points that require consideration in the cells are spectral sensitivity, linearity of response, stability and fatigue. Preliminary tests with a B. and L. opacimeter showed erratic movements of the microammeter needle. These were due to current fluctuations in the illumination circuit. It was found advisable to discard resistance for lamp voltage adjustment, because of fluctuations. The reason is that the total resistance in the



Effect of filament voltage on illumination.

circuit is only 2 ohms and (as shown in Figure 1) the illumination varies rapidly with the voltage. The curve in Figure 2 shows how readings fall off for constant light intensity, to a nearly constant level. It also shows how the cell recovers quite rapidly on resting. Thus the fatigue of the cell becomes of utmost importance. The procedure found expedient was the following:—

When the battery is first connected, 15-20 minutes were allowed for a steady battery voltage and cell output with a white material over the sample aperture. The needle is then set to 100 with the standard white only in position. The sample is then introduced and rapid readings are taken. Finally a recheck of the standard white is made, and the needle should return to 100 ±0.2. Another factor to be considered is the effect of parallelism of white backing and the flatness of the sample. The white disc and sample must be exactly parallel to the aperture and flush with it or loss of light occurs, with an error in reflected light reading. It was interesting that individual observers could check themselves with an accuracy of 0.1, but that different observers often did not check each other. Standards of whiteness by the use of

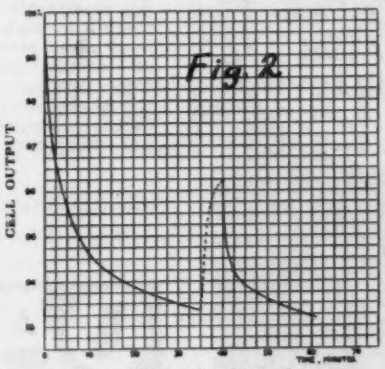
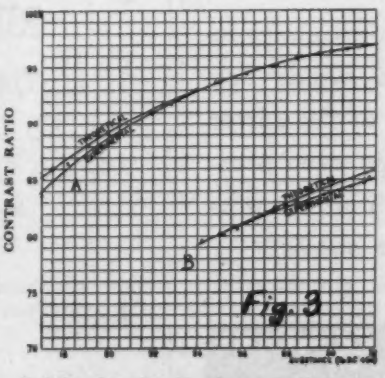


Photo-electric cell fatigue and recovery.

magnesium oxide seems to be subject to some error (magnesium nitride?); magnesium carbonate is probably more satisfactory.

The opacity standard is a piece of opal glass of very uniform density. It is finely ground on the side placed against the aperture. (Its opacity is 0.746). Tests show that the opacimeter is capable of greater accuracy than is the eye (in which the limit of differences is 0.6 per cent. Specific opacity is a term found of use in comparing the relative opacities of two papers differing in pulp or finish. By taking for comparative purposes a sheet of fixed substance we have the basis for opacity value (opaqueness). Specific opacity is the term for opacity measured at or corrected to a specified substance at a definite humidity. Substance measurements were made by



Variation of opacity with substance for Newsprint (A), and bleached sulphite sheets (B).

weight and area corrected to 65 degrees humidity. The form of opacity—substance curves for newsprint and bleached sulphite are shown in Figure 3. The experimental points lie close to the smooth (theoretical curve) at least with newsprint (A). This is in the case of laboratory sheets. In machine-made papers, larger variations require the use of a number of samples. With sulphite (B) there is a greater divergence. These theoretical curves are based on the theory of Kubelka and Munk (cf. Steele Paper Trade J. 100 March 1935). The article refers fully to American literature and experimental work carried out in the U. S. A. The actual results of British workers (and the variations and differences) are tabulated. T. H. Farebrother. Paper-maker and British Paper Trade J. (International number; midsummer) (1937) 30-44; 78.

◆ Thickness-Swelling Volumes of Pulps

The term Dicken-Quellvolumen (thickness-swelling volume) refers to the volume of one gram of pulp (bone-dry basis) in the swollen state measured by noting only the thickness of the test sheet without considering shrinkage. When alkali of mercerizing strength is used, it gives practical information about the capacity of a dipping press (Tauch Presse) for a specific pulp, and furnishes valuable supplementary information to the amount of absorption of swelling agent.

The method for determining this was outlined in Merkblatt No. 10, Papier Fabr. 34, 17, 1936, and is reasonably accurate. The authors have made an exhaustive review of the literature, and have outlined the correlation between degree of swelling and hygroscopicity, absorbtion of moisture in the humidity chamber, binding of water, degree of beating, properties of sheets formed from such pulps, rate of attack by acids, rate of reaction with alkalis and oxygen, rate of esterification, dyeing properties, rate of drying, adsorption of swelling agents from their solutions, change in form during swelling, *et al.* Since even slight differences in freeness have a marked effect on the thickness-swelling volume, (which falls with increasing freeness), it is possible through technological changes in certain parts of a mill to impart definite colloidal changes to the pulp. Pulp shows a marked swelling maximum in 10.5 per cent NaOH. Cotton linters pulp shows a maximum in 8-9 per cent NaOH, but then shows a further swelling maximum in 16-18 per cent NaOH (which was not observed with wood pulp). The use of 17.7 per cent NaOH served regularly in determining the thickness-swelling volume and

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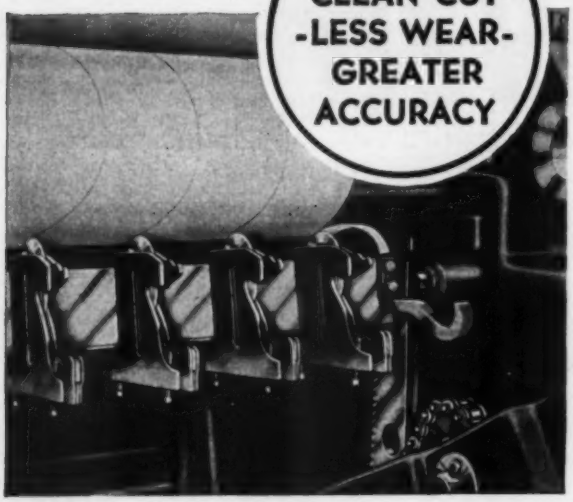

The definite results mentioned above were made possible by designing the lever so that spring pressure is applied directly onto the axle of the slitter wheel itself. The advantage of this design is obvious as in this way a lighter spring pressure is required, making it possible to carry a sharper edge on the cutter wheel.

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was found entirely satisfactory. By using this method of measurement, it is possible even in as complex a mixture of wood pulp to gain some insight into the influence of the various factors on swelling. On removal of residual lignin (during bleaching), and on dissolving out hemicellulones with alkali, by heat, the swelling capacity of pulp drops. However, this capacity rises immediately, even during the purification process, provided there are intramicellar swelling effects (e.g., as in the case of the action of fairly concentrated acids and alkalis). The action of as little as 4 per cent NaOH shows a definite swelling effect. Totally differing swelling data are given by purified celluloses, even those having the same alpha-cellulose content, depending on whether hot or cold purification was used. Especially with highly purified pulp, cold purification shows a much higher swelling capacity and forms a more porous sheet.

There is not necessarily a correlation between thickness-swelling volume and viscosity. The former sinks with falling viscosity due to oxidation in alkali (e.g., during bleaching). However the thickness-swelling volume may actually increase when acid treatment has definitely lowered the viscosity, provided mercerization effects have been called into being. In multiple stage bleaching, the thickness-swelling volume changes with the degree of whiteness of the pulp. The thickness-swelling volume increases during pulp storage. The swelling data are also of marked importance in characterizing paper pulps, since it is correlated with the rate at which a pulp reaches a certain degree of beating and with its parchmentizeability. The method referred to may readily be used as a control method in pulp mills, and in rayon and cell wool factories. George Jayme and Rudolf Steinmann. Papier Fabr. 35 (Tech. Teil) 337—64 (1937).

◆ Examination of the So-Called Lignin of Spruce

When both Willstätter lignin and alkali lignin were treated with benzyl chloride and 35 per cent NaOH each yielded a benzylated product having the approximate composition of 74 per cent C and 6.1 per cent H. However the two products were in fact very different from each other. Whereas the benzylated Willstätter lignin was practically insoluble in all solvents, and was largely unaffected by fuming HCl, the benzylated alkali lignin is soluble in warm benzyl alcohol, in benzol, and partially soluble in fuming HCl. The authors deduce that the two lignins are not more or less pure varieties of the same substance, but are actually chemically entirely dissimilar. When the original spruce wood is benzylated, the product contains 70.3 per cent C and 6.9 per cent H. This is a mixture of substances that can be separated (by extraction with benzyl alcohol and glacial acetic acid) into two fractions having practically the same per cent carbon. The solubilities and analytical data make it appear improbable that one of these is benzylated lignin. There is no reaction between benzylated wood and aqueous alkali at 170 deg. C. On treatment with fuming HCl, about ⅓ of the product enters solution. The residue should really be a benzyl lignin, but evidently shows none of the properties of the so-called benzylated lignins referred to above. This, according to the authors, furnishes further evidence that lignin is not present in the original wood, and that it is in reality a secondary product. While spruce wood requires a temperature of about 170 deg. C for delignification with dilute alkali, 60 per cent NaOH causes a loss of 55 per cent of the wood even at 100 deg. C. The residue has very nearly the same per cent C and H as the original wood, the only difference being that the methoxyl content is 5.8 per cent higher than usual. By repeated treatment with 60 per cent NaOH further portions go into solution until only 17 per cent remains. This final residue has the approximate composition of cellulose. On the other hand very concentrated caustic potash solutions at 110 deg. C (even after the first treatment) yield cellulose-like products to the extent of 45 per cent of the original wood. The composition and the amount of the yield seem to be functions of the temperature. The reactions are not due to true solution, but presumably to the degradation of a larger molecule into fission products of various sizes. From the

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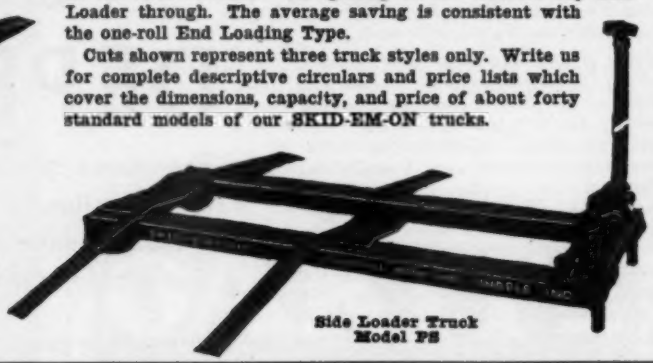

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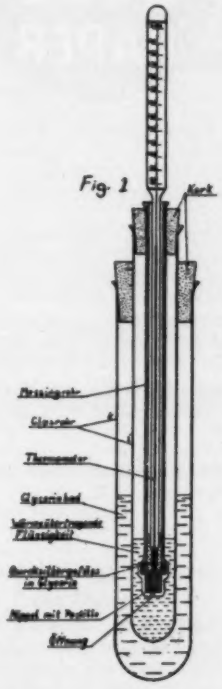
extraction with 60 per cent NaOH, on addition of alcohol, products are obtained which when treated with water give a soluble and an insoluble portion, both of which contain 2—3 per cent methoxyl and 46—47 per cent C (i.e., products which may be considered intermediate between wood and cellulose). On treatment with 42 per cent HCl they yield so-called lignins with 10.6—11.7 per cent methoxyl. This behavior is different from that of the original wood (which yields lignins with higher methoxyl contents). This is in keeping with the hypothesis that the investigators are dealing with a fission product of the wood substance. (Note by abstractor: No mention is made that these reactions have been followed by means of the microscope.) R. S. Hilpert and O. Peters. Ber 70, 108—116 (1937) through Papier Fabr. 35, (Abstracts) 127, (1937).

◆ The Plastoscope

This is a new, simple instrument for testing thermoplastic substances, substances which under pressure or heat or both begin to flow without becoming actually liquid. Pitch obtained from the evaporation of sulphite liquor is an example and various samples of this were examined. This pitch may be in the form of a calcium, sodium or ammonium salt. It is brittle at ordinary temperatures and plastic at higher temperatures. The plastoscope serves to register the temperature at which a permanent change in form (of the pitch) takes place. Details of the plastoscope (assembled) are shown in Figure 1. A nipple (a) is that part of the apparatus which contains a compressed pellet of the substance under examination (nippel mit pastelle). (a) has a standard 3 mm. bore hole which permits extrusion of the thermoplastic substance when its form changes. Into the upper part of the nipple a brass tube (messingrohr) is screwed and this tube contains the thermometer, the bulb of which is immersed in glycerin (Quecksilbergefäss in Glycerin). Nipple and metal tube, as the illustration shows, are inserted into the glass tube (i) which holds a liquid that conducts heat without dissolving the thermoplastic substance (e.g., in the case of sulphite pitch, paraffin oil is used). This tube in turn is inserted into the outer glass tube (k) which again serves as a glycerin bath. The outer tube (k) is heated carefully until the thermoplastic substance is extruded (see Figure 2) in the form of a miniature curlecue sausage. At this point the thermometer reading is taken. The production of the thermoplastic pellet within (a) prior to the test is important, and the various unassembled parts of the equipment used in its formation are shown in Figure 3, while Figure



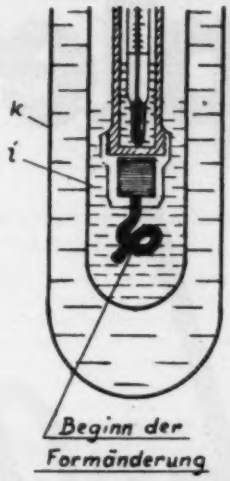


Fig. 2.

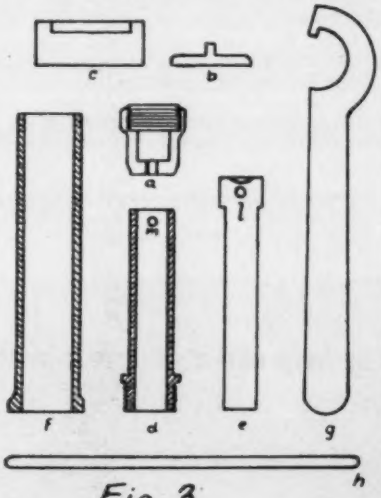


Fig. 3.

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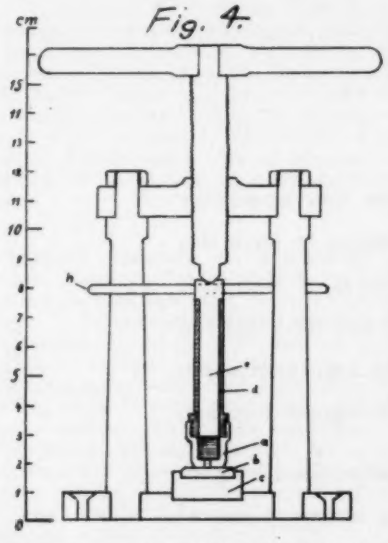
4 shows the press in which the pellet is formed within (a). Here (b) is a matrix entering the bore hole in (a) and resting on base plate (c). Into (a) at its upper end is screwed the collar (d). The powdered thermoplastic substance is screened (440 meshes per sq. cm.) and introduced through (d) into (a), care being taken to exclude moisture and adhesion to the walls of (d). The stamping device (e) is then inserted into (d), and (e) carries a rod (inserted through hole (1)) which,

Fig. 4.



when pressure is applied gradually in the press (Figure 4) until (e) barely makes contact with the upper end of (d) a pellet of the correct size is formed. Ordinarily 0.6 g. of powder is used, and if the technique is carried out carefully, the pellet just fills (a), which is then unscrewed from (d) by means of spanner wrench (g), screwed into the brass tube described above and shown in Figure 1. Moisture in the original thermoplastic powder plays a marked role in the extrusion temperature. The results in individual samples, however, are very sharply reproducible. The cleaning of the press and the nipple are clearly described. Solvents (water in the case of sulphite pitch) are used. August Noll, Papier-Fabr. 35 (Tech. Teil) 365 (1937).

◆ Adsorption and Removal of Dyes from Straw

In studies on the equilibrium between dyestuffs and straw, it is essential to take into consideration the high acid content of unbleached straw, since this lowers the degree of dispersion of a number of colors (e.g., Congo red), and may play havoc with attempts to determine residual dyes in the equilibrium dye bath (by titration with dyes of opposite charge). Chinese wheat straw takes up pure substantive and acid dyes (acid naphthol yellow, its salt, crystal ponceau 6B, benzol scarlet 4BS, Congo Red, etc.) sharply, according to law of solution. Since, however, equilibrium between the straw and the dye bath usually requires 1-3 weeks, it may appear as though adsorption equilibria were occurring. This is especially true when the dyestuff is less dispersed and if insufficient time has been allowed to reach equilibrium. All these dye equilibria are reversible. Basic dyes (e.g., methylene blue) however, are adsorbed firmly, and the reaction is irreversible. This indicates the precipitation of the positively charged dyestuff on the negatively charged straw cellulose, and it may be further that there is a chemical interaction between the basic dye and acid groups in the straw. Straw bleached in alkaline medium adsorbs the basic dye more strongly than does unbleached straw. A. Lottermoser and P. Neubert. Koll-Beihefte 45, 149-s09 (1936), through Papier Fabr. 35 (Abstracts) 131 (1937).

◆ Polymerization of Technical and Natural Celluloses

The former work of Standinger and Ritzenthaler requires a slight correction. K_m (of cellulose in cuprammonium solution) should be 5x10–4 (instead of 10–3). This was shown by comparing the viscosity of cellulose ester sols with that of polyanalogous celluloses in Schweizer's reagent. A large number of celluloses from different sources were examined. Raw cotton, linters, ramie, flax, hemp, manila hemp, sisal, nettles, jute, papyrus, as well as the so-called synthetic cellulose produced by bacilli, were studied. The mean degree of polymerization for all of these was about 2000, a value which is only slightly changed after precipitation from cuprammonium solution. However, in immature parts of the plant, the cellulose in the tissues has a lower degree of polymerization.

Fir (at the top of the crown) contained cellulose in which this figure was 1000. The following degree of polymerization are recorded:—cellulose from beech leaves (1190); oak leaves (1350); rye leaves (1000); immature rye stalks (1160); mature rye straw (1600); asparagus (9000). When rye decomposes with the formation of methane the polymerization drops to 490. After passing the intestine of a horse, straw drops from 1390 to 670.

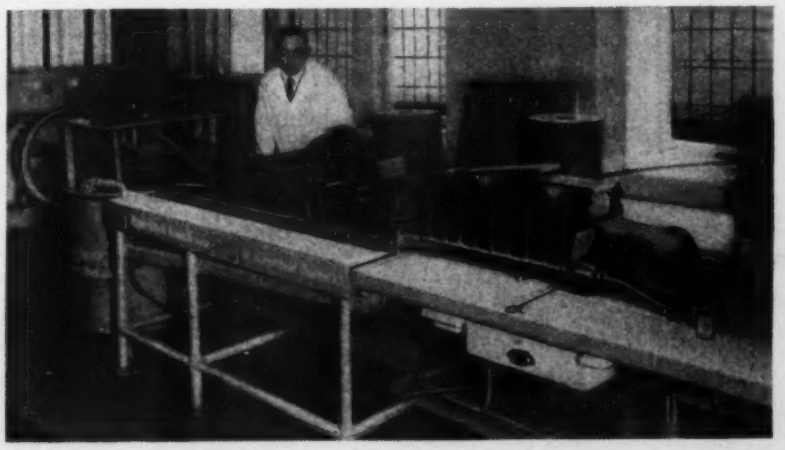
Pulps vary in their degree of polymerization from 600-1000. Japanese pulp have the unusually high value of 1250. Bleaching causes a steady decrease in the degree of polymerization. In cuprammonium silks, viscose, cellophane and cellulose nitrate, the figures are respectively 400-500; 300-400; 300, and 200. There is as yet no definite correlation between such figures and mechanical strength data. However, when the figure drops below 200, the pulp is unsuited to artificial silk manufacture. H. Staudinger and K. Feuerstein. Annalen der chemie, 526, 72-102 (1936); cf. also Papier-fabr. 35 (Fest und Auslandsheft) July 1937, 233-42.

◆ Oxidized Cellulose and Nessler's Reagent

A color reaction discovered 30 years ago, has since then found wide application in the textile industry in detecting damage due to overbleaching. Celluloses having copper numbers varying from 0.09 to 4.96 were examined. With a Cu number of 0.14, the Nessler reagent showed a definite bright orange coloration within 30 minutes, while with a Cu number of 0.44, the color reaction manifests itself at the end of 1 minute. The action probably depends primarily on the reduction of mercuric iodide to the yellow mercurous iodide through the action of aldehyde groups in the so-called oxycellulose. This mercurous iodide then decomposes as follows: $Hg_2I_2 \rightarrow Hg + HgI_2$ (free gray mercury and red mercuric iodide). In the system which contains potassium iodide, the mercuric iodide is converted into the less colored $KHgI_2$, so that after a series of color changes have taken place, the gray coloration of the element mercury predominates. H. Ditz and F. Ulrich. J. Prak. Chem. (New Series) 147, 167 (1936).

◆ The Smallest Paper Machine

This is evidently the smallest machine in operation. It is set up in the Haus der Technik in Berlin. Its overall length is 2 meters, and its width is 15 cm. The sheet produced is 12 cm. wide. The drying cylinders are 10 cm. in diameter, and the output of paper is 600—800 grams per hour. Anonymous, Wochbl. Papier Fabr. 68 (Tech. Tl.) 598 (1937). *(See below).*



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Compiled by James Atkins, Registered Patent Attorney

2,085,163—Paper. Herbert A. Lubs, Wilmington, Del., and John R. Roberts and Edwin R. Laughlin, Penns Grove, N. J., assignors to E. I. du Pont de Nemours & Company, Wilmington, Del., a corporation of Delaware. No Drawing. Application April 16, 1935, Serial No. 16,612. 10 Claims. (Cl. 8—5.) Process of preparing an improved surface colored paper which comprises impregnating a surface colored paper with an aqueous solution of an acetate of deacetylated chitin.

2,085,417—Apparatus for Corrugating Paper. Joseph D. Cramer, Goshen, Ind., assignor to The Chase Bag Company, New York, N. Y., a corporation of Delaware. Application August 24, 1935, Serial No. 37,736. 8 Claims. (Cl. 154—30.) A creping machine, comprising a base plate having thereon a series of plates pivoted at the rear end and laterally adjustable at their front end and each plate having a groove in its upper face and traveling chains adapted to travel in said grooves to form pleats in the paper passing over said bed plates.

2,085,874—Safety Paper and Method of Making Same. Francis L. Simons, Needham, Mass., assignor to George La Monte & Son, Nutley, N. J., a corporation of New Jersey. No Drawing. Application February 4, 1935, Serial No. 4,873. 8 Claims. (Cl. 91—67.95.) A safety paper having incorporated therein a primary mono-amino diphenyl.

2,087,263 — Cellulose Pulping System and Product Thereof. Fredrich Olsen, East Alton, Ill., assignor to The Cellulose Research Corporation, a corporation of Delaware. No drawing. Application February 4, 1935. Serial No. 4,878. 8 Claims. (Cl. 260—101.) The process of treating cellulose comprising supplying woody material containing cellulose fibers having a natural moisture content in excess of 20%, treating said material to remove non-cellulosic constituents and separating said fibers as a pulp while always maintaining said cellulose associated with at least 20% of a wetting medium preserving the cellulose penetrable and permeable so that said cellulose is never permitted to fall below 20% content of a wetting medium, and reacting said saturated cellulose to form a chemical compound with a reagent.

2,087,529—Roll Paper Cutter Bar. Clarence D. Portle, Chicago, Ill. Application April 23, 1936. Serial No. 76,030. 9 Claims. (Cl. 242—55.5.) A cutter bar structure for use in connection with a support for a paper roll, said structure comprising a bar carrying a cutting knife, a pair of arms pivotally connected with each end portion of the cutter bar, said arms having means coacting therewith to pivotally connect the same with the supporting structure for the paper roll, the means for pivoting one of said arms of each pair being so constructed and arranged to permit said arm to have limited endwise movement, and means coacting with the endwise movable arm when moved in one direction to hold the arms against swinging movement. A cutter bar assembly for use in connection with the supporting structure for a paper roll comprising a cutter bar, said cutter bar including a top plate having a blade disposed along its outer margin, end plates depending from the top plate, a back plate depending from the rear marginal portion of the top plate and terminating above the lower extremities of the end plates, the lower marginal portion of the back plate being disposed inwardly with respect to the end plates, a guide plate interposed between the end plates and positioned below the back plate to provide a slot for the passage of the paper as it leaves the roll, and means connected to the end plates of the cutter bar for engaging the same with the roll supporting structure, said means being constructed and arranged to allow the back plate of the cutter bar to contact with the paper roll.

2,087,556—Stuff Treatment Apparatus. Charles P. Tolman, Kew Gardens, N. Y., assignor, by mesne assignments, to The Noble & Wood Machine Co., Hoosick Falls, N. Y., a corporation of New York. Application March 28, 1934. Serial No. 717,717. 13 Claims. (Cl. 92—26.) Stuff treatment apparatus for paper pulp or other material comprising a casing with inlet and outlet ports, a rotor mounted to rotate in the casing and having its working face on its periphery, independent stators in the casing movable towards and away from the working face of the rotor, fluid pressure means connected with the stators to move the stators towards and away from the rotor, and valve mechanism to control said fluid pressure means to vary the effective working pressure of each stator.

2,087,557 — Material Treating Apparatus. Charles P. Tolman, Kew Gardens, N. Y., assignor, by mesne assignments, to The Noble & Wood Machine Co., Hoosick Falls, N. Y., a corporation of New York. Application April 2, 1937. Serial No. 134,461. 12 Claims. (Cl. 92—26.) In stuff treatment apparatus, the combination of a rotor, a feed chamber opening upon a segment of the peripheral surface of the rotor, a stator mounted to form a treatment zone with said peripheral surface of the rotor, said feed chamber having an opening positioned and adapted to pass particles too large or too refractory to effectively enter and pass through the treatment zone between the rotor and the stator, and means to control the passage of said particles through said opening.

2,088,402 — Resurfacing Machine for Paper Making Machine Suction Boxes. John A. Borck, Nutley, N. J., assignor to Eastwood-Nealley Corporation, Belleville, N. J., a corporation of New Jersey. Application August 16, 1935, Serial No. 36,461. 1 Claim. (Cl. 51—34.) In a re-surfacing machine for paper making machine suction boxes, a longitudinal bed comprising a pair of spaced parallel tracks and having a base adapted to support a suction box between said tracks, a carrier mounted upon said tracks for longitudinal movement above said box, a hinged supporting member carried by said carrier having bearing portions at each side, a motor carried by said supporting member at one end, a grinding wheel carried by said supporting member at the other end between said bearing portions and adapted to engage the upper surface of said box between said tracks, and drive means between said motor and said grinding wheel, the weight of said motor and grinding wheel being forwardly of the hinge axis whereby their combined weight is applied to the work during the sur facing operation, said motor and grinding wheel being symmetrically arranged at each side of the longitudinal central plane of said bed and carrier.

2,088,524—Process of Producing Absorbent Paper. Louis Leonard Larson, Hockessin, and George Lewis Schwartz, Wilmington, Del., assignors, by mesne assignments, to The Celastic Corporation, Arlington, N. J., a corporation of Delaware. No Drawing. Application August 1, 1934, Serial No. 738,018. 2 Claims. (Cl. 92—13.) A process which comprises cooking liberated wood pulp under pressure at a temperature within the range of 170-190° C. with caustic soda solution of about 2-4% concentration and a pulp consistency within the range of 2.5% to 4.5%, continuing the treatment from one-half to not more than 3 hours until the freeness of the pulp has increased to at least 20% above that at the start and discontinuing the tretament before the percentage freeness increase falls below 20%.

2,088,893—Paper. Leroy C. Cates, Westbrook, Maine, assignor to S. D. Warren Company, Boston, Mass., a corporation of Massachusetts. Application October 9, 1935, Serial No. 44,266. 10 Claims. (Cl. 92—68.) Process of making a varnishing

GOOD WILL is the one and only asset that competition cannot undersell or destroy.

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PARCHMENT—KALAMAZOO—MICHIGAN

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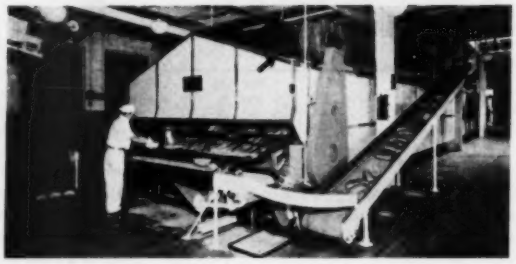

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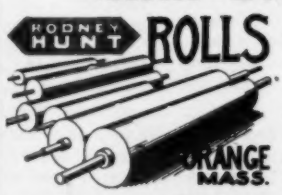

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grade of uncoated paper which comprises, temporarily softening at least one surface of an evenly formed paper web by adding sufficient moisture thereto to produce when supercalendered a surface of the nature of glassine, and supercalendering the web before the moisture has had time to penetrate and soften more than the surface layers of the paper with the softened surface against the metal supercalender rolls.

2,089,293—Safety Paper. Clifford Paine and Jack Augustus Radley, Blackley, Manchester, England, assignors to Imperial Chemical Industries Limited, a corporation of Great Britain. No Drawing. Application August 5, 1935, Serial No. 34,839. In Great Britain August 8, 1934. 17 Claims. (Cl. 91—67.95.) The method of rendering paper and the like sensitive to ink eradicating chemicals which comprises incorporating therein a 4:4'-di-(benzoylamino) stilbene 2:2'-di-sulfonic acid compound.

2,089,469—Paper Web Joining Member. Lawton A. Dix, New York, N. Y. Application June 22, 1933, Serial No. 676,987. 6 Claims. (Cl. 154—42.) An improved joint of two ends of paper webs, comprising a strip of adhesive material normally frangible, said strip being perforated to allow flexing thereof on a relatively sharp radius without breaking, and two ends of paper web secured together by said perforated material strip without having said perforations filled, said strip as affixed between said ends forming a joint that allows the paper webbing to pass around a roller of relatively small radius without either of the paper web ends tearing at the edges of said strip material.

2,089,480—Paper Coating Composition and Process. Clark C. Heritage, Rumford, Maine, assignor to Oxford Paper Company, a corporation of Maine. No Drawing. Application October 26, 1932, Serial No. 639,735. 8 Claims. (Cl. 134—18.) The process of making a coating composition suitable for coating paper, which includes the steps of forming a slurry of a base pigment mixed with water and with hydrated lime comprising by weight more than 5% of the filler substance and then causing alum to react with a portion of the lime leaving the rest as free lime.

2,089,524—Machine for and Method of Making Coated Sheet Material. Allen Abrams and Charley L. Wagner, Wausau, Wis., assignors to Marathon Paper Mills Company, Rothschild, Wis., a corporation of Wisconsin. Application September 16, 1935, Serial No. 40,767. 5 Claims. (Cl. 91—55.) A machine for coating frangible web material with a thermoplastic coating composition, which comprises a driven roll having a resilient surface for supporting the web material to be coated, a heated doctor roll driven at a lesser surface speed than said driven roll, means for adjustably positioning the doctor roll with respect to said first roll to control the thickness of the coating applied to web material passing between said rolls, said doctor roll being positioned so as not to contact said coating after being applied to said web, and a chill roll in close proximity to said first roll to receive and chill the coated paper quickly after being coated.

2,089,525—Machine for and Method of Making Coated Sheet Material. Allen Abrams, George W. Forcey, and Robert A. Farrell, Wausau, Wis., assignors to Marathon Paper Mills Company, Rothschild, Wis., a corporation of Wisconsin. Application September 5, 1936, Serial No. 99,648. 6 Claims. (Cl. 91—12.) A machine for coating web material with a thermoplastic coating composition, which comprises a rubber covered roll, means for heating said roll, a cooperating heated doctor roll, means for driving said doctor roll at a slower speed than said first roll but with the cooperating surfaces of said rolls moving in the same direction, means for adjustably positioning said doctor roll with respect to said first roll, spaced strips of sheet metal positioned between said rolls to control the thickness and spacing of the stripes of the coating applied to said web ahead of said doctor roll from a mass of said coating composition as said web passes between said rolls, and a chilled roll around which said coated web is passed after leaving said first roll.

2,089,949—Process of Coloring Paper. Pierre Drewsen, Sandusky, Ohio, assignor to The Hinde & Dauch Paper Company, Sandusky, Ohio, a corporation of Ohio. Application May 6, 1935, Serial No. 20,102. 7 Claims. (Cl. 101—153.) A process of coloring paper comprising the feeding of a paper strip between a knurled roller and a roller having a resilient surface flooding the surface of the knurled roller and the paper surface adjacent thereto with coloring material whereby in the movement of the paper between said rollers surplus coloring material is squeezed out and the color in the indentations of the roller is deposited on the surface of the paper and after separating from the paper removing all coloring material from the portions of the resilient roller which are adjacent to the edges of the paper subsequently contacting with the roller.

2,089,992—Continuous Bleaching Process and Apparatus. John Campbell, Lancelot O. Rolleston, and George A. Smith, Glens Falls, N. Y., assignors to International Paper Company, New York, N. Y., a corporation of New York. Application March 14, 1932, Serial No. 598,582. 9 Claims. (Cl. 8—2.) A method of bleaching fibrous, cellulosic material which comprises continuously forcing a body of the same in a substantially dry, solid, tightly packed mass through a reaction chamber, said material being so introduced and withdrawn as to effect a substantially air-tight seal at the inlet and outlet, withdrawing the air from said material as it passes through one portion of said chamber, and introducing a gaseous bleaching agent into said material as it passes through a subsequent portion of said chamber.

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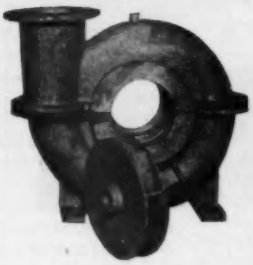

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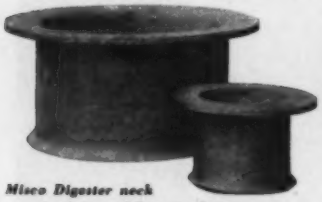

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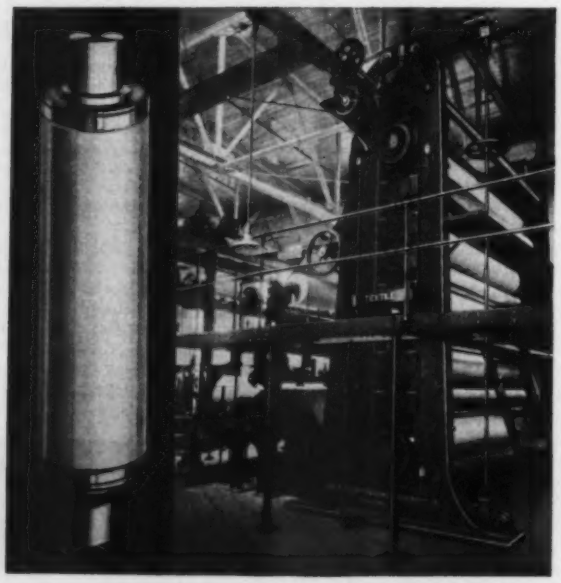

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The COMMERCIAL OUTLOOK

New York, November 1, 1937.

IT IS almost inconceivable that demand for paper could undergo such contraction as has been recorded recently. The market is near to a standstill. Buyers, with very few exceptions, have figuratively crawled into their corners, and cannot be prevailed upon to engage in any purchasing whatsoever, other than to satisfy urgent needs. The disappointing volume of business has obliged manufacturers to reduce further their production schedules, and there are numerous paper and board mills scattered in various sections of the country which are now operating only three or four days per week.

Paper consumers and converters apparently are pursuing an extreme hand-to-mouth buying policy. Although inventories generally are not judged excessive by standards of a few months ago, buyers evidently are determined to lower stocks well under levels previously considered normal. The decline in commodities generally, the downward reaction in securities and the slowing up of general business has affected sentiment appreciably and adversely, and the volume of the movement of paper and board into consuming channels has decreased sharply.

Encouraging is the fact that all the economists and others who are supposed to know insist that the present lull is temporary only; that we are not by any means headed for another depression, and that the country will snap out of the prevailing slump earlier and quicker than the average business man now believes will be the case. The contention is that fundamental conditions are favorable, and that the present condition is due principally to a break-down of sentiment, which will not continue long. Meanwhile, there seems no doubt that the probable output of paper and board mills for the final quarter of 1937 will recede well below that of the first three-quarters of the current year and also under the last quarter of last year.

An important announcement in the newsprint branch of the industry was the Great Northern Paper Company's contract basis on standard newsprint of $48 a ton, delivered New York basis, for the first half of 1938. This price represents an increase of $5.50 a ton above the present newsprint level to contract buyers, but it is $2 per ton below the basis of $50 a ton promulgated by all other newsprint producing companies in the United States and Canada for the first six months of next year. Newsprint publishers, or those who do not secure newsprint from the Great Northern Company, have set up a loud cry against being "penalized" an extra $2 a ton for their paper for next year, but in spite of the weeping and wailing of the publishers, newsprint companies on this and the other side of the Canadian border line, as well as on the Pacific Coast, have reaffirmed their price of $50 for next year.

The general index of advertising for September registered an increase of 3.9 per cent over the corresponding month last year, but declined 1.2 per cent from August this year, according to *Printers Ink*. The index of newspaper advertising showed a 2.5 per cent gain for September over the similar month in 1936 and a rise of 0.3 per cent over August last. Farm paper advertising rose 2.9 per cent over September a year ago, but declined 8.6 per cent from August.

Production of newsprint in Canada totaled 312,351 tons in September, compared with 318,713 tons in the preceding month and 269,782 tons in the similar 1936 month, according to the News Print Service Bureau. Shipments were 306,548 tons, against 313,435 tons in the month before and 269,689 tons in September, 1936. United States output in September amounted to 77,635 tons, and Newfoundland's total was 31,160 tons, making a total North American production of 421,146 tons. Shipments from United States mills in September amounted to 73,838 tons. At the end of September, stocks at Canadian mills were 89,553 tons, and at United States mills 21,473 tons, making a total in both countries of 111,026 tons, an increase of 9,600 tons over the total a month previously.

During the first nine months of 1937, Canadian production of newsprint was 2,729,089 tons, an increase of 18.5 per cent over the same time last year, while shipments from mills were 2,662,871 tons, a gain of 17.7 per cent. In the similar period, Canadian shipments to the United States were 2,114,564 tons, an increase of 23.8 per cent. Canadian shipments to overseas markets were 422,728 tons, a decrease of 5.7 per cent.

Stocks of newsprint on hand and in transit for 430 United States publishers totaled 480,314 tons on September 30, against 435,839 tons a month before, the American Newspaper Publishers' Association reports. These stocks, the Association estimates, were equal to fifty-seven days' supply at the rate of consumption in September, against a fifty-nine days' supply for the August 31 stocks at the August consumption rate. Stocks on hand at the end of September last year amounted to thirty-four days' supply, and on September 30, 1935, to thirty-five days' supply. The 430 reporting newspapers used 253,502 tons of newsprint during September, against 243,237 tons in the similar 1936 month, an increase of 4.2 per cent.

Consumption of newsprint in the United States during the first nine months of 1937 for the 430 newspapers consuming approximately 80 per cent of the total was 2,268,386 tons, against 2,113,923 tons in the corresponding period a year ago. Allowing for the remaining 20 per cent, consumption totaled 2,835,483 tons for the nine months, compared with 2,642,404 tons last year, a rise of 193,079 tons.

Production of paperboard in the United States in August amounted to 365,521 net tons, showing an increase over the 344.080 tons produced in the preceding month and a larger gain over 319,391 tons in the same month last year, according to the monthly Census Bureau summary. The August output brought the total of the first eight months of this year up to 3,067,755 tons, a rise of 32.2 per cent over 2,320,106 tons in the corresponding period in 1936. New orders received for board in August called for a total of 346,009 tons, contrasted with 326,334 tons in the month before and 332,553 tons in August, 1936. Unfilled orders held by manufacturers at the end of August called for 72,944 tons, against 90,391 tons a month previously and 117,443 tons on the same date a year before.

Shipments of prepared roofing from mills in the United States amounted to 2,671,158 squares, against 2,152,482 squares in the month preceding and 2,978,526 squares in the similar 1936 month. Shipments during the first eight months of the current year aggregated 20,347,816 squares, contrasted with 19,930,302 squares in the corresponding period of 1936, and 16,905,348 squares in 1935.

◆ ◆

◆ Personnel Changes at Hercules Powder Company

The Hercules Powder Company has appointed Harry F. Kolb as director of purchases to succeed Ralph B. McKinney, who has been assigned to special duties with the Paper Makers Chemical Division of the company. Mr. Kolb, who is now assistant manager of the Hercules' San Francisco office, will assume his new duties in Wilmington, Del., about December 1, the date that Mr. McKinney's transfer becomes effective.

◆ New Uruguayan Mill

A new Uruguayan company has been formed for the manufacture of paper from cellulose, it was learned recently. A factory for this purpose has been established at Mercedes, about 175 miles from Montevideo and sufficient machinery for commencement of operation has already been purchased from Germany. The owners claim to have invested 300,000 pesos (peso is equal to .7925 U. S. currency) in the plant.

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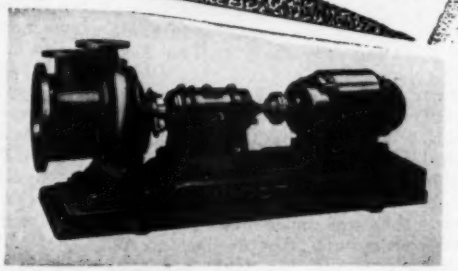

Warren Steam Pump Co., Inc., Warren, Mass.

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Cleaner, stronger, permanent, and more economical — Kalamazoo glazed tile tanks are helping 98 mills do a better production job at a lower cost. Write for new brochure.

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Domestic RAW MATERIALS

◆ Papermaking Rags

Demand for practically all papermaking raw materials has fallen to an exceedingly low ebb. It can be said that many grades of rag stock, pulp, old paper and other material are in almost no call whatever, and the market situation is an unusual one for this time of the year when ordinarily paper and board manufacturers are absorbing supplies in good volume.

All classes of papermaking rags are very quiet. Some groups of mills are out of the market entirely, or certainly insofar as concerns any worthwhile purchasing. Signs are that manufacturers have accumulated fairly sizable inventories, and are drawing on these supplies and keeping out of the market as buyers while intent on reducing their stocks. As usually is the case under these circumstances, the trend of the market is wholly in favor of consumers. Prices of most rags are receding at a rather rapid clip, the decline in some grades having reached fairly sharp dimensions.

New cotton cuttings of most descriptions are available at considerable reductions. While dealers ask 8 cents a pound f. o. b. shipping points for No. 1 new white shirt cuttings, this same price for unbleached muslins, 3.25 cents for fancy shirt cuttings, 6.25 cents for light silesias, 7 cents for new blue overall cuttings, 8 cents for bleached canton flannels, 6.50 cents for light flannelettes, 3 cents for cottonades and 2.75 cents for washables, there seems no doubt purchases could be effected in some quarters at below these prices. So little actual business is doing that the market lacks definite levels; it is difficult, in fact, to determine what prices really prevail.

Moreover, the export movement of cuttings has decreased appreciably, and this accentuates the dullness of the market and places dealers in a position where it would appear there is no telling what prices they might be tempted to accept to dispose of some portions of their stocks.

Roofing rags have continued to decline. Buying by felt mills recently has slowed down to a point where practically no business is being done in these rags, and it is axiomatic in the roofing stock trade that unless these rags are provided with an outlet, prices move off steadily. In the East roofing rags are reported on offer to mills at 1.35 cents a pound f. o. b. shipping points for No. 1 domestic roofing stock and one cent a pound for No. 2 stock, with the probability that purchases could be effected under these prices. Foreign roofing rags are neglected and prices are strictly a nominal matter at approximately 1.70 cents a pound ex dock New York for dark colored cottons of northern European origin. Importers lay stress on the fact that markets abroad are livelier and higher than is the case here at present, with the result rags can scarcely be bought at prices in line with nominal levels existing here currently.

Old white cottons are 3.75 to 4 cents a pound for No. 1 repacked whites f. o. b. dealers' shipping points, twos and blues 2 cents and repacked thirds and blues 1.80 cents.

◆ Old Paper

The waste paper market is dull, weak and prices have moved sharply lower recently. Demand for all classes of consumers has subsided to a degree where the movement of supplies is far under normal for this period of the year, and it is clearly apparent that stock is backing up on dealers' hands. Board mills, evidently owning large stocks of old paper, are keeping out of the market while bent on reducing inventories, and although there is a good deal of talk within the trade regarding exports of some grades to Europe, there is reason to believe the shortage of ship space is holding down the actual tonnage moving out of the country.

The price condition is so uncertain that it is difficult to say what market levels of some grades actually are. Shavings have eased to where New York dealers are reported offering No. 1 hard white shavings at 2.40 to 2.65 cents a pound f. o. b. that city, depending on the quality of the shavings involved, and No. 1 soft white shavings at 2.15 to 2.30 cents for ordinary and 2.60 cents for one-cut grade. Hard white envelope cuttings are off to 2.75 cents a pound at shipping points, book stock has declined to 80 cents per hundred pounds for No. 1 heavy magazines, old kraft has eased to 85 cents per hundred pounds, and ledgers are down to 1.30 cents a pound for white and 1.15 cents for colored.

No. 1 mixed paper is 30 cents a hundred f. o. b New York and 35 cents at Chicago, while folded newspapers are 37½ cents a hundred pounds New York and 45 cents Chicago. Such specialty grades as new kraft envelope cuttings have dropped to 2.15 cents a pound, maybe less, at shipping points, new manila envelope cuttings to 1.85 cents, and colored shavings to 50 cents per hundred pounds.

◆ Rope and Bagging

A series of price reductions has brought the quotational basis on No. 1 domestic old manila rope down to 3 cents a pound f. o. b. dealers' shipping points, and at this level there is very little demand from paper mills. Foreign rope is quoted at about the same price, although importers state they cannot buy abroad cheap enough to be able to sell to consuming customers at so low a level. Bagging is tending downward after enjoying a brief period of fair demand. No. 1 scrap burlap for papermaking is approximately 1.90 cents per pound at shipping points, No. 1 domestic gunny bagging 2.15 cents, and roofing bagging 90 cents per hundred pounds.

◆ Pulpwood

Pulpwood quotations are maintained despite a quieting of demand. There is a steady movement against contracts but buying currently has subsided to a pronounced degree.

◆ Mechanical Pulp

Domestic producers of mechanical wood pulp seem fairly well sold up and are shipping out tonnage consistently against contracts, but there is little fresh demand now developing. Indications are consumers in general are getting along with supplies on hand or being received against back commitments, and do not find it necessary to augment their stocks by additional purchases. Producers continue to name around $37.50 per short ton for moist groundwood for prompt shipment, delivered at consuming points in northern United States, yet there are cases where orders probably are being accepted at concessions from this price. Water conditions have been favorable in most grinding regions, and this has eliminated much of the open market demand which might otherwise have developed.

◆ Chemical Pulp

Despite a sagging of quotations on foreign wood pulp; that is, on spot lots for resale in the domestic market here, the imported product is still, in a majority of cases, well above a quotable parity with domestic chemical pulps, and the result is domestic manufacturers are adhering firmly to established price levels. In fact, they divulge no disposition to sell at any concession. As regards sulphite—bleached and unbleached—producing mills in the United States are so well sold they have little or no pulp to divert to the outside market. Last quarter prices of 3.50 to 3.70 cents a pound, according to quality, on bleached and 2.85 to 2.95 cents on unbleached sulphite ex dock American Atlantic seaboard still obtain for contract customers. Domestic kraft of southern origin is offered at 2.50 cents a pound, perhaps at 2.25 cents, delivered at consuming centers. Domestic bleached soda pulp is on a contract basis of 3.25 cents a pound delivered paper mills.

◆ Chemicals

Casein is quotably steady at 14 cents per pound for domestic standard ground and 15 cents for finely ground, packed in bags, for carload quantities. The contract basis of $18 per long ton is maintained on brimstone, at mines. Soda ash is 1.05 cents a pound in bags, f. o. b. works.

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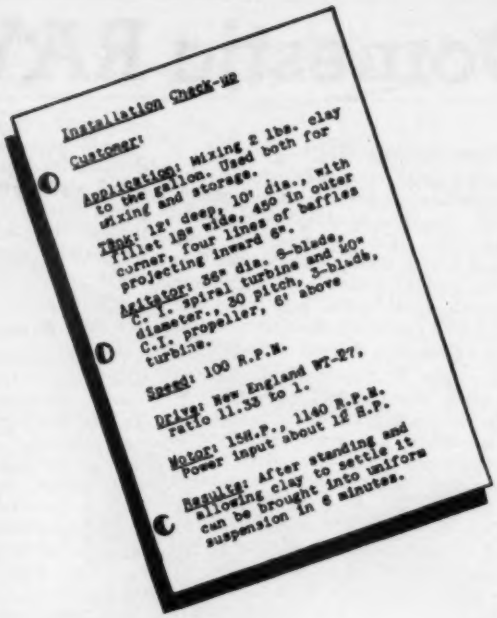
Installation Check-up
Customer:
Application: Mixing 2 lbs. clay to the gallon. Used both for mixing and storage.
Tank: 12' deep, 10' dia., with fillet 18" wide, 450 in outer corner, four lines of baffles projecting inward 6".
Agitator: 36" dia. 3-blade, C. I. spiral turbine and 10" diameter, 30 pitch, 2-blade, C.I. propeller, 6' above turbine.
Speed: 100 R.P.M.
Drive: New England WT-27, ratio 11.33 to 1.
Motor: 15H.P., 1140 R.P.M. power input about 12 H.P.
Results: After standing and allowing clay to settle it can be brought into uniform suspension in 6 minutes.

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Now, with "New England" Agitator Drives and Turbine Stirrers a 3000 lb. load is thoroughly mixed in 10 minutes, with density varying less than 1% from that desired!
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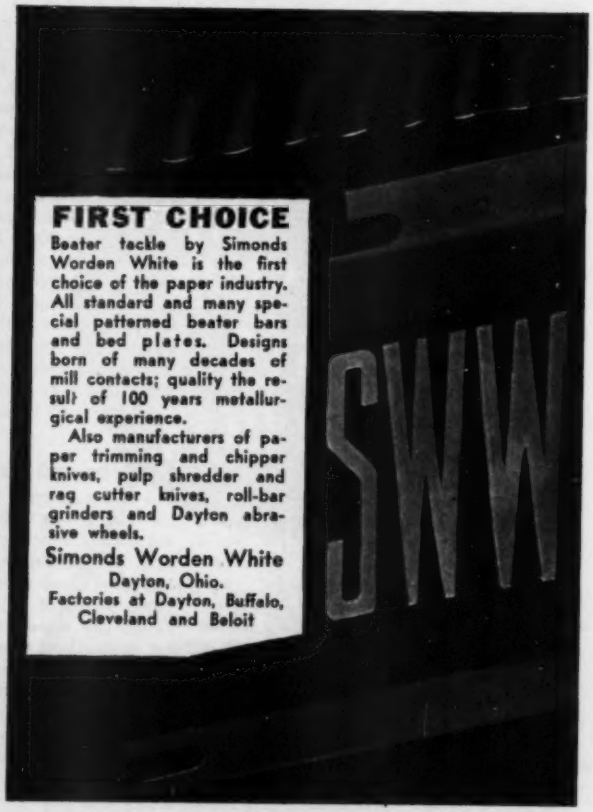
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Import and Export MARKETS

IMPORTS

◆ Paper

Imports of newsprint paper, which make up about 85 per cent of the United States total paper importations, dropped off 15 per cent during August as compared with the preceding month. The total receipts amounting to 260,158 tons, however, were about 6 per cent higher than recorded for the corresponding month last year, according to figures issued by the U. S. Department of Commerce. Of the remaining imports, other printing papers, greaseproof and waterproof papers, surface-coated papers, writing papers and paperboards of various sorts were substantially higher than in the same month last year. Imports of kraft wrapping paper, another important item in the paper group, were 33 per cent under the preceding month and 51 per cent below the similar month in 1936. Imports of pulpboards in rolls showed an improvement of 12 per cent over the month before, but a decline of 25 per cent compared with August, 1936. Total imports of paper and paper products during August were valued at $11,033,239, of which $9,675,678 represented newsprint and $1,357,561 all other paper and paper products. These figures represent increases over August, 1936, of 10.7 per cent for total imports, 11.2 per cent for newsprint and 7 per cent for other papers.

Imports during the first eight months of the current year, January to August, inclusive, reached an aggregate value of $87,579,661, compared with $69,083,701 in the corresponding period of 1936.

◆ Paper Stock

Imports of paper base stocks into the United States during August last declined slightly contrasted with the preceding month, although the total value of such receipts amounting to $11,731,403 was nearly 20 per cent higher than for the month of August, 1936. This increase over a year ago was due partly to the heavier volume of pulpwood and waste of various sorts, exclusive of rags, and partly to higher prices this year.

Imports of wood pulp, totaling 216,523 short tons, dropped off 5 per cent compared with July this year, but were about on a level with the corresponding month last year. Receipts of sulphite pulp were somewhat higher than in 1936, but increases in this class amounting to 7,904 tons were more than offset by a decline of 9,467 tons in imports of unbleached sulphate pulp. Imports of bleached sulphate pulp and of soda pulp were larger than last year, but these two items are relatively small compared with other classes of pulp. Imports of papermaking rags, amounting to 6,336 tons, were 50 per cent under receipts recorded last year. Total importations of paper stock during August were valued at $11,731,403, of which $2,133,521 comprised pulpwood, $9,199,403 wood pulp, and $398,602 waste for papermaking.

◆ Wood Pulp

It might be said there are two sets of quotations on imported wood pulp in the market at present—and they are a wide distance apart. Producers abroad adhere to price levels which they have named for some time, are offering sparsely and show no inclination whatever to accept anything below the prices named. Prime bleached sulphite is quoted for shipment from Europe during the balance of this year and in 1938 at up around 5 cents per pound ex dock American Atlantic seaboard, prime strong unbleached sulphite at 3.75 cents, and prime Scandinavian kraft pulp at 3.50 cents.

On the other hand, resale lots of spot pulp in this country are to be had at substantially under these prices. Prime bleached sulphite is reported available from resale quarters at 4 cents, unbleached sulphite at 3 cents and krapt pulp at between 2.75 and 3 cents, ex dock Atlantic seaboard basis. These constitute about the bottom prices resellers will entertain, but at least small tonnage lots are put on the market now and then at these levels. As a matter of fact, pulp prices at the moment mean little or nothing because so few buyers are in evidence that almost no sales are being consummated, and the market consequently lacks established levels. Paper and board manufacturers, having their raw material requirements provided for over a time and little concerned with augmenting their supplies, are not to be prevailed upon, it would seem, to engage in any pulp buying, regardless of price. The market is in a next to dormant condition, with about the only activity observable being created by those consumers of pulp who have some surplus tonnage which they are endeavoring to resell.

Imports of chemical pulp into the United States in August amounted to 201,019 short tons of 2,000 pounds, air dry basis, valued at $8,873,086, according to U. S. Department of Commerce figures, comparing with 202,136 short tons of a declared value of $8,846,698 in July of this year, and 198,511 short tons valued at $7,384,204 in August last year. The August arrivals brought the total for the first eight months of the current year up to 1,477,384 short tons, contrasted with 1,314,157 tons in the corresponding period of 1936. A new high record of pulp importations is being established this year.

EXPORTS

Exports of paper and paper products from the United States during August reached an aggregate value of $2,807,426, according to U. S. Commerce Department figures. These exports did not mark any great change over the values recorded for the two preceding months but were nearly 50 per cent higher than the value recorded for August, 1936. Exports of newsprint, book and writing papers, sheathing papers and paperboards continued high, although the first two items mentioned failed to reach the level of the preceding month. Shipments of paperboards, including boxboards, were far ahead of those recorded for the preceding month or the corresponding month last year. Exports of building boards, however, showed a tendency to slacken. August shipments of both insulating and wall boards were not only considerably lower than the preceding month, but were approximately 10 per cent less than a year ago. Exports of sheathing papers dropped off about 15 per cent compared with July but more than trebled the August, 1936, shipments. While the increase in value as compared with August last year was due to some extent to a higher level of prices this year, there is no doubt but the volume of shipments was higher in August last than a year previously.

Exports of paper and products during the first eight months of the current year, January to August, inclusive, reached a total value of $20,785,022, compared with $14,947,287 in the same period of 1936.

Exports of wood pulp from the United States decreased to some extent during August as contrasted with the month preceding, but at the same time were 67 per cent higher than in the similar month last year. Bleached sulphite continues to be an important item, representing about three-fourths of our wood pulp exports. The August shipments of this class of pulp were 10 per cent under those recorded for the preceding month, but were 75 per cent above the August, 1936, shipments. The decline in exports of unbleached sulphite, which constitutes the greater part of the remaining pulp shipments, was relatively larger, amounting to over 20 per cent. Exports of other paper stock, mostly rags and waste paper, dropped off considerably during August. Total exports under this group reached an aggregate value of $2,298,959 in August, against $2,831,845 during July this year and $1,139,104 in August, 1936.

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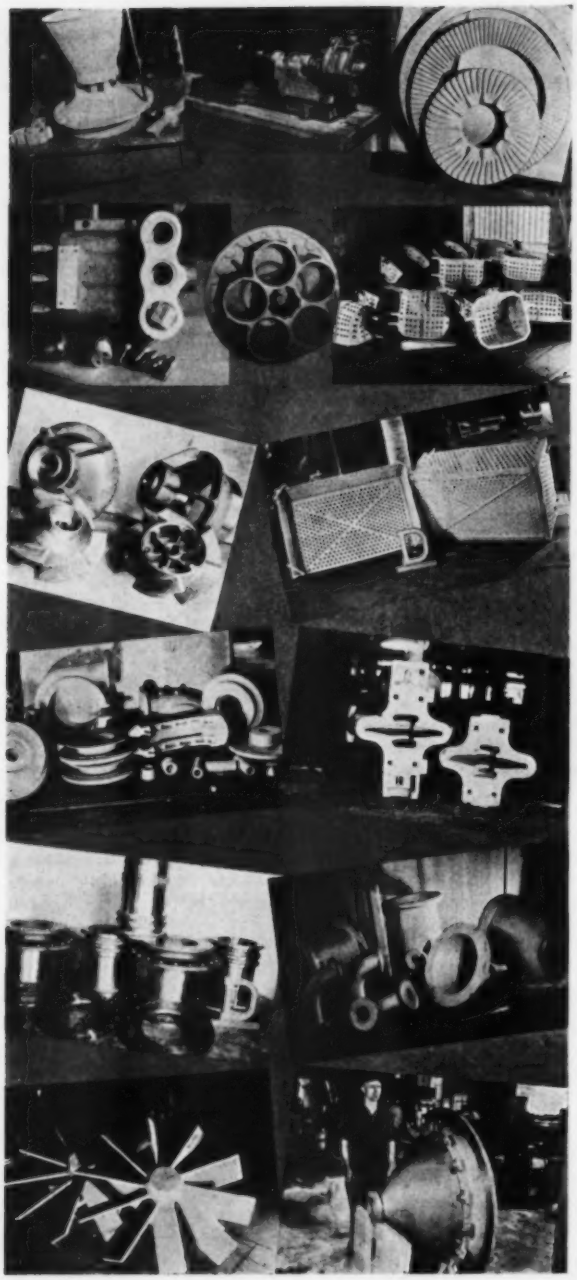

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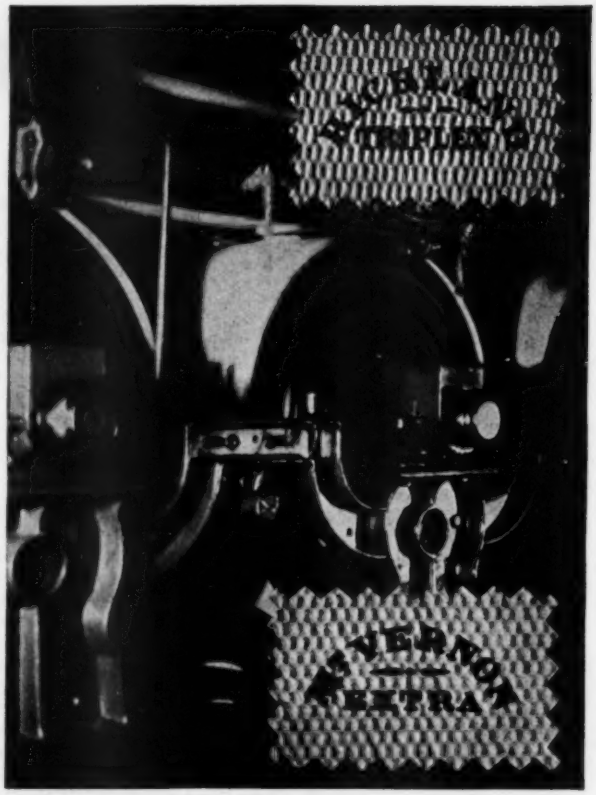

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